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INFLUENZA AND OTHER RESPIRATORY INFECTIONS.¹

By F. M. BURNET,

Director of the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne.

The General Epidemiology of Respiratory Diseases.

It is a platitude to remark on the fact that in civilized communities the minor and major respiratory infections are the commonest of human ills, and if we consider together the mortality, the period of illness and the subsequent disabilities, they are probably the most important socially and economically. Respiratory disease can be regarded as the inevitable result of the aggregation of human beings that is characteristic of civilized life and even more so of military service. In the last analysis it means merely that a large variety of microorganisms have normal or potential ability to gain their nourishment and multiply on the mucous surfaces, that civilized conditions provide many opportunities for their transfer from one individual to another, and that as yet no practical technique for preventing this transfer has been developed.

Infected saliva and sputum may pass to another nose or throat or other bronchial passages by many routes. Droplets liberated into the air by talking, coughing and sneezing may be the most important, particularly when they evaporate, leaving light flakes of dry, infected material which can be carried deep into the lower part of the respiratory tract. Another means of transfer that is attracting much attention at present is the secondary liberation into the air of saliva and sputum that has dried on textiles, especially bed clothes, and in addition there are the innumerable ways in which salivary transfer may be accomplished on fingers, eating utensils and the like.

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on May 25, 1944.

Transfer of respiratory pathogens is inevitably more or less universal, and it is equally inevitable that civilized communities should have developed a sufficient resistance to their action to ensure that at most times and in most places symptoms from such infections are trivial or absent. This resistance is almost certainly mainly immunological in origin. From childhood on there is a constant training of the body to deal with respiratory infections and to develop the appropriate specific immunity, and in all probability some non-specific mechanisms of resistance as well.

In this lecture I shall not be concerned with the various specific infective diseases which spread by the respiratory route nor with the rarities like psittacosis or pneumonic plague. My subject is the relatively minor illnesses known at some time or other to all of us and ranging from the mildest cold through varying degrees of febrile illness to severe acute influenza or the more prolonged illnesses of the atypical pneumonia group. It is highly probable that the primary stage at least of all these infections is due to invasion of the respiratory epithelium by one or other of a group of viruses, and it is certain that all are prone to be followed by secondary bacterial infections of varying degrees of severity. My concern tonight is only with the primary invaders.

In discussing the epidemiological behaviour of these infections, we are immediately faced with the difficulty that only in regard to one group have we any satisfactory means for laboratory study. Something can be gained from purely clinical epidemiological studies, as I hope to show; but as with every other group of infectious diseases, very little progress can be made until it is possible to give a specific aetiological diagnosis to the particular epidemic under study.

There are a number of interesting clinical and epidemiological observations in regard to the behaviour of respiratory infections in semi-isolated communities, particularly in Arctic communities. Here the complexities introduced by the constant contacts of civilized life are minimized and we can see some of the basic pattern of respiratory virus infection.

In Spitzbergen before the war the population consisted mainly of Norwegian coal miners living in a few separated mining settlements. They were completely isolated from the outside world from November to May, and during this period the population was free from respiratory infection except for a few sporadic colds. Such colds as occurred were associated particularly with visits in the spring of persons from one mining settlement to another. Norwegian writers state that definite epidemics of colds might be produced in this way before the arrival of the first ship of the summer season. With the arrival of the first ship there was invariably an explosive epidemic of colds, including a proportion of febrile attacks. Colds continued to be fairly prevalent till September, after which they gradually disappeared.

In Angmagssalik, a very isolated Eskimo community in east Greenland served by only one ship a year (arriving some time between July and September), conditions are similar to those in Spitzbergen. In the spring, before the ship arrives, meetings of people from isolated settlements produce mild outbreaks of colds; but a much more severe outbreak follows the ship's arrival. At irregular intervals influenza appears at this time, the last reported instance being in 1935. This epidemic began two months after the ship's arrival and spread rapidly along travelling routes, but did not reach communities cut off from all contact with infected centres. There was a high mortality rate involving 10% of the total population, so that one can feel reasonably confident that the disease was true virus influenza.

Another similar example was the epidemic of influenza in Point Barrow, Alaska, in 1934. This commenced eight days after the arrival from Canada of three apparently healthy travellers by aeroplane. It is distinguished from dozens of similar episodes only by the circumstance that influenza virus A was isolated from throat washings sent to the United States.

From such occurrences several deductions can be drawn, which appear to be in accord also with the less easily analysed behaviour of respiratory infections in civilized communities: (i) resistance to infection is due to recent past infection with the virus concerned; (ii) in the "colds" group of infections, resistance is rather highly specific, people immune to the viruses of their own community being still sensitive to those of another isolated group; (iii) asymptomatic carriers of colds viruses are extremely common amongst persons who have recently left large civilized communities; (iv) even in summer (a presumably much smaller) proportion of such persons carry influenza virus; (v) it may take up to two months before an influenza virus introduced into an isolated community develops its full epidemic character; in the meantime it presumably passes from person to person subclinically or producing only minor "cold" symptoms.

The general lesson frequently exemplified in camps and barracks is that immunity to these viruses can be obtained only under conditions of repeated exposure. The recruit from the country is in the same relative position when he enters camp as the Arctic dweller is when the first ship reaches him. Recent work on atypical primary pneumonia in America shows that it conforms to the same pattern of behaviour. General undifferentiated respiratory infections invariably attack recruits more than seasoned men, the peak being shown usually four to eight weeks after induction. In at least two large camps the curve of incidence of diagnosed primary atypical pneumonia was parallel to that of the curve of respiratory infections generally, but one-tenth the height. The predominant incidence among recruits and the peak incidence about six weeks after induction were equally evident.

Ætiological Diagnosis.

With perhaps an occasional exception, any diagnosed respiratory infection is a result of the multiplication in the respiratory tract of one or more types of pathogenic microorganism, and the first necessity of ætiological diagnosis is to isolate and identify the responsible organisms. From the nature of my work and training it is naturally this aspect of ætiology that particularly interests me. But one cannot avoid the admission that contact with

the microorganism is only one of the necessary ætiological factors. Seasonal and climatic factors undoubtedly play a part, and in addition common lay experience is probably correct in laying stress on individual factors, perhaps hereditary, perhaps associated with minor anatomical abnormalities, perhaps nutritional. These factors appear to be more important with regard to the minor than the more serious infections, but they will need to be carefully elucidated before any adequate account of the whole group of infections can be given.

Virus influenza was the first of the group from which an ætiological agent could be isolated and studied. So far two distinct types of virus have been obtained, A and B. Each of these types covers a number of strains with a rather wide range of immunological character, but the difference between A and B strains appears to be complete in the immunological sense, and the clinical and epidemiological characters of influenza A and influenza B also seem to be different. It is probable that no other main types of influenza virus exist.

The technical methods of isolation and study of the virus are of no direct interest to a clinical audience, and I shall merely state that by modern methods the influenza viruses can be studied with as much ease as the streptococci. Laboratory work in the present connexion is important chiefly in allowing us to define the clinical and epidemiological characteristics of influenza A and influenza B.

During most epidemics of influenza A the standard clinical picture is the text-book one of "typical influenza"—an acute onset, general symptoms being much more prominent than respiratory symptoms, the characteristic flushed face and injected conjunctiva, pharyngitis, leucopenia. Even in a typical influenza A epidemic there are lower grade infections with a slower onset, and completely subclinical infections may occur which can be recognized only by serological investigation. Influenza B may also produce the typical syndrome; but in my experience it has usually taken a more nondescript form, beginning with a day or two of preliminary "cold" before the subject felt ill enough to report to a medical officer.

The typical influenza epidemic is also a straightforward affair. In an infection involving the surface epithelium of the respiratory tract, free liberation of the virus occurs. There is a short, two-day incubation period, and after recovery from the infection there is a temporary high-grade immunity against reinfection. The disease, therefore, spreads very rapidly and dies down completely or nearly completely in four to eight weeks by exhaustion of the susceptible population.

The characteristics of a typical epidemic of influenza may thus seem perfectly simple, but many points still remain to be elucidated. First, we have only vague ideas as to why anything from 70% to 90% of the population in any given epidemic escape infection. It is only in isolated communities that more than 50% of a population ever goes down with influenza. Some of those who escape have merely been lucky; they have missed receiving an infective dose of the virus. Others have a subclinical infection, without symptoms recognizable as influenza, but with a rise in antibody. For the rest, we have no explanation by which to account for their resistance, apart from a speculation that following infection some persons retain an acquired resistance for many years—a resistance not clearly associated with antibody levels.

Then there is the problem of the conditions which initiate an influenza epidemic. Obviously we must have three conditions: (i) a source of virus, (ii) a sufficient number of susceptible individuals, and (iii) appropriate conditions for spread from person to person.

The question of the source of the virus from which an epidemic is initiated is difficult. There are three main possibilities. The first is that the virus is always active somewhere, and that it needs to be reimported to initiate a new epidemic, behaving therefore very like measles. This undoubtedly held for the great epidemic of 1890 and for the 1918-1919 pandemic, and it can be taken as pragmatically true for any small community. But (the second possibility) there is other evidence that after a period of

quiescence influenza can flare up again in a country or other large community without importation of fresh virus. This may mean that there are true long-period carriers of the virus. No such carriers have yet been detected, and on epidemiological evidence they must be rare, unless, as Andrewes has suggested, the virus can persist in some form not recognizable by current methods. The chief evidence in favour of the existence of carriers is contained in such episodes of infection in isolated communities as I have mentioned earlier. The final possibility, and perhaps the one most in line with the evidence, is that in a large community influenza does not really disappear with the apparent termination of an epidemic. The infection continues to pass, but in a predominantly resistant community many of the infections are subclinical and only an occasional case or a small group of cases can be recognized as influenza. This was the condition that was apparently present in Victorian army camps during 1943, and evidence of a similar state of affairs was obtained last year in America. This low-grade spread through a resistant population is not an effective means of maintaining the virus; many infection chains will fail, and even in a large community there will always be chances that the virus may disappear altogether. The evidence suggests that from about 1855 to 1889 the influenza virus was absent from England, but equally, that it has never been completely absent since.

The two other requirements for the initiation of an epidemic (a sufficient density of susceptible persons and suitable conditions for transfer) can hardly be considered separately, since the density of susceptibles necessary will naturally be lower when conditions are favourable for spread (for example, in crowded camps in winter) than when they are unfavourable (for example, in civilian populations during summer). It will probably make this point clearer if we put it in the form that an influenza epidemic can be started whenever in the community in question an infected person can in the period of, say, eight to twelve hours before he has to retire to bed, come into infective contact with an average of two or more susceptible individuals.

Such a statement presupposes that we know a great deal more than we actually do both about individual susceptibility and about what I have called infective contact. It is a good working hypothesis that susceptibility or resistance in normal adults living in temperate communities is determined more by the extent of acquired immunity than by any other factor. The existence of some acquired immunity can be recognized by the presence of antibodies against the virus in the serum, and the degree of immunity may with many qualifications be guessed at from the quantitative level of such antibodies. As in most problems of this sort, there is a correlation between high antibody level and resistance; but it is far from absolute. In my own mind I have no doubt that specific immunity of any sort is mediated by antibody; but circulating antibody levels alone will not tell how effectively the antibody will be used to prevent or abort the corresponding infection. Some persons can utilize a given level of antibody much more effectively than others.

Then, again, anyone who has studied the duration of antibody or immunity in persons immunized by any of the currently used antigens—diphtheria or tetanus toxoids, for example—knows of the great degree of variation in the rate of disappearance of antibody. Jensen, for instance, found, amongst children immunized uniformly against diphtheria toxoid, some who from the rate of fall of antibody would react again to the Schick test in twelve months, others who theoretically at least would retain immunity beyond the term of their natural lives. A further complication arises from the fact—again general for infectious diseases—that different strains of virus differ in virulence, and that a more virulent strain can override an immunity that would be effective against a less virulent strain.

Once a sufficient density of susceptibles and a virus of normal virulence is present in the community, the time at which an influenza epidemic appears seems to be determined largely by meteorological conditions. A sudden

drop in temperature usually precedes the initial stages of the epidemic, and with rare exceptions (of which the first European wave of 1918 is the most important) influenza epidemics never start in summer or early autumn. Most epidemics occur in the coldest months in late winter, but recently there has been a tendency for epidemics to start earlier, in May here, in late November in the United States of America and Britain. Suggestions may be made as to why cold weather favours influenza, but there seems to be no complete explanation available—probably a number of factors are involved.

Clinical, Laboratory and Epidemiological Diagnosis of Influenza.

An epidemic of influenza can be diagnosed with some certainty when many patients show the typical acute, prostrating onset without early localizing signs, when there is a short, two-day incubation period, when spread throughout the community is rapid, and when more than 10% of the population are involved. The great majority of such epidemics studied in various parts of the world since 1933 have been proved to be due to influenza A. Two have been due to influenza B. Unfortunately one cannot state the converse—that an epidemic without these characteristics is not influenza.

Influenza B does not normally produce extensive epidemics. The virus appears to have both a lower virulence and a lower power of spread than most A strains. In normal winters there is a steady trickle of cases associated with symptoms as a rule not of the typical acute character and indistinguishable from those of many non-influenzal conditions. Less frequently, influenza A infections may have a similar character.

Diagnosis must therefore be based essentially on laboratory tests. These are not intrinsically of any interest to the clinician or epidemiologist, and I shall confine myself essentially to the clinician's contacts with the laboratory—the methods of obtaining material for laboratory study and the information that the laboratory can provide from such study.

In a given case of influenza the virus may be isolated from throat washings, or evidence of specific infection can be obtained by comparing the antibody content of two specimens of serum, one taken early in the disease, the other twelve to twenty days after the onset. So far neither method can give a final answer as to the nature of the illness in less than a week, and laboratory investigation can therefore give no information that will be of any use to the clinician concerned with any individual case. The primary virus infection at least will be over before an aetiological diagnosis can be provided. Laboratory investigations are therefore primarily of epidemiological importance—they aim at diagnosing the nature of a given epidemic, not of any individual infection.

Material for the isolation of virus should be taken as early as possible in the illness, and certainly not more than forty-eight hours from the onset. The patient is given ten cubic centimetres of saline solution to gargle, preferably immediately after waking in the morning, when secretions in the nasopharynx have had a chance to accumulate during the night. After a minute's gargling the fluid is delivered into a clean, sterile receptacle, and five cubic centimetres of nutrient broth or serum broth are added to act as a protective agent. The mixture is transferred to a sterile test tube, which is corked, packed in ice and sent as speedily as possible to the laboratory.

A positive result for influenza A or B virus from such a specimen is final evidence of the nature of the infection—subject only to the possibility of laboratory contamination by stock strains of virus. A negative result has no significance as such. There are many difficulties in isolation, particularly of influenza B virus, and no worker ever obtains 100% of isolations from patients proved by other means to be infected with one or other of the influenza viruses.

For the serological tests ten cubic centimetres of blood should be taken aseptically at the same time as the throat washings. If the patient is in a centre more than a day's journey from the laboratory, the serum should be

separated from the clot and sent without preservative. Otherwise blood (without any anti-clotting agent) should be sent. Fourteen days after the onset a second sample of serum should be obtained for comparison with the first sample.

Such serum pairs may be tested in several ways—the most frequently used test is to determine the activity of the serum in inhibiting the power of influenza virus to agglutinate red cells (the Hirst test); complement fixation can also be used, or the neutralization test in mice. Whatever test is used, the essential information obtained is whether or not the second sample shows a significant increase in antibody level above that present in the first. Practically speaking, it will be only in a proportion of childhood infections that the first specimen of serum will show no antibody at all. All normal adults can be expected to show serological evidence of past infection with both A and B viruses. A comparison of the two titres of the serum pair is therefore absolutely necessary if the nature of the infection is to be determined. When there is a significant increase of antibody (a twofold increase or greater is usually regarded as significant), this establishes the diagnosis as influenza A or B. When both first and second samples show a low antibody level, this can be taken as excluding influenza; but when both show approximately equal high or moderately high levels, the verdict in the present state of knowledge has to be "not proven". There seems to be little doubt that on occasion a person may suffer from symptomatic influenza without a demonstrable antibody rise above the initial level. This may reflect inadequacy of technique rather than a real failure of antibody production. If in a sample of serum an increase from five to forty units is found, this is an eightfold increase easily demonstrable by any technique; but if the same increase of 35 units occurs in a sample of serum with an initial titre of 400, no practical technique will detect the difference between 400 and 435, and the only possible report is that no significant change has occurred.

The Possibilities of Preventing Influenza.

From what is at present known of the pathogenesis of influenza we can enumerate a number of possible lines of attack on the problem of prevention; but a little thought will show that most of them are completely impracticable.

The first suggestion would be to prevent the transfer of infectious material from person to person. This could be done effectively if all human intercourse could be carried out across screens impervious to living influenza virus, either mechanical (glass partitions, respirator-type masks), chemical (such as propylene glycol vapour in an atmosphere of appropriate humidity) or physical (ultra-violet light barriers). Such arrangements may be of great value for some specific purposes, but it is obviously ridiculous to think that they could ever become universal. Even if some entirely new principle should be evolved, so that it became a practical proposition to eliminate air-borne infection in civilized communities, we should immediately come up against the inescapable dilemma that is encountered when we try to eliminate an endemic disease—namely, that under natural conditions a community resistance to the endemic disease is built up largely by subclinical or mild infections. When any effective means of preventing such infection is applied, it becomes necessary to continue its application indefinitely; any breakdown will sooner or later result in damaging epidemics.

The only practical approach to prevention of respiratory disease is to increase the resistance of the host, and as I have mentioned previously, the greatest reason for optimism that we have is the fact that in any epidemic of influenza, even the most severe, the morbidity is always below 50%. The major problem of influenza research has always seemed to me to be that of determining why the majority of people resist influenza, and of applying this knowledge to protect those who would normally be susceptible. It is the best working hypothesis that resistance is essentially immunological in character, and that differences in the resistance of individuals in the same epidemiological unit are due primarily to differences

in the efficiency of their immunological reactions. It is unfortunate that so far there is practically no evidence whatever as to what determines these individual differences in human beings, in virtue of which, for example, one child fails to react to the Schick test for an indefinite period after toxoid immunization, while another reacts again to the test within a year. The rate at which the antibody level in the serum falls can be measured readily enough; but other aspects of immunological activity which may be important against influenza are at present hardly susceptible to experimental study. These include the quality or avidity of antibody, the localization of antibody or antibody-producing cells in strategic tissues, and the speed and effectiveness with which antibody can be mobilized to abort infection before symptoms appear.

Our attempts to increase resistance immunologically are frankly crude. Their aim is essentially to reinforce an ineffective mechanism by providing an artificial stimulus shortly before the time when infection may be expected, so that a higher concentration of antibody may be available when it is required.

Two types of procedures have been developed in an attempt to provide such an artificially heightened immunity. One is to inject subcutaneously killed influenza virus in the largest practical amount. The other is to administer attenuated living virus by the natural route—that is, into the nose or deeper into the lower part of the respiratory tract.

Immunization with killed virus given subcutaneously is theoretically the less ambitious procedure. It is concerned only with raising the level of blood antibody, on the reasonable basis that this is the only measurable index of resistance that is available. Since influenza virus cannot multiply in subcutaneous tissues, there is no difference in principle if living virus is given subcutaneously, and one or two workers have used such a vaccine. In general, however, most workers have considered that the danger that a living virus vaccine may be contaminated by another pathogen more than outweighs the advantage that the living virus is a more complete and natural antigen than one damaged antigenically by the process of killing. In America at the present time the use of concentrated formalin-killed vaccines is generally regarded as the only practical means of immunization. Extensive trials of this method were made during the past American winter. The results are not yet available, but from personal discussion with those responsible for the trials I know that the preliminary conclusions were highly favourable. In groups immunized (by good fortune in timing) only two to four weeks before the height of an influenza A epidemic, there was a four to one advantage in favour of the immunized as against valid control subjects.

These results are distinctly better than those obtained in the previous influenza epidemic of 1940-1941 in the United States of America, when the best results claimed showed only a 50% advantage in favour of the immunized, while in several groups no effect was observed. My own summary of the experience with this type of immunization would be (i) that it is the best means yet established for producing a significant rise in circulating antibody, (ii) that at the period of maximal antibody production 70% to 80% of the persons who would otherwise have contracted influenza are protected against mild epidemic influenza, (iii) that this period of effective protection probably lasts only for a few weeks, and (iv) that protection would be progressively less evident as the virulence of the infecting strain of virus increased.

The really important question in regard to influenza immunization is, of course, whether the method advocated would give protection against serious influenza of the 1918 pandemic type. Any answer can be only a guess; mine would be that subcutaneous immunization with a vaccine of the appropriate antigenic type would have practically no effect on the morbidity, but might reduce the mortality.

The second type of vaccination utilizes living attenuated virus to induce a low-grade infection of the respiratory mucosa with minimal symptoms. The theoretical aim is to mimic as closely as possible the process by which the

normal resistance of most human beings has been developed, and perhaps thereby to influence those mechanisms which are responsible for the local mobilization of antibody as well as to raise the circulating level.

It is along these lines that we have been working for some years; but it must be confessed that difficulties both theoretical and practical have become more and more apparent. The production of attenuated virus provides no particular difficulty, but it is very difficult indeed to judge the particular degree of attenuation which in a majority of susceptible individuals will provoke a definite antibody rise, but will at the same time produce no unpleasant symptoms in the small minority of the most susceptible.

There is further evidence that the dose and mode of administration in the respiratory tract will influence the intensity of the symptoms produced and the antibody rise. For instance, the old laboratory strains of influenza A (PR8) and B (Lee) produce practically no symptoms in the great majority of adults when administered intranasally by coarse spray. If, however, relatively large amounts of virus suspended in a fine mist are inhaled deeply into the air passages, a febrile illness with symptoms (more marked in adults than in children) is produced.

Up to the present the method we have been using is to administer the attenuated living virus into the nasal cavity with a simple atomizer, the object being to infect the respiratory mucosa of the nose, but not that of the bronchi and bronchioles. The virus is prepared like all other types of influenza vaccine by growth in the allantoic cavity of the chick embryo; it is checked for activity and for the absence of contaminating bacteria and used within fourteen days.

Through the cooperation of the army authorities in Victoria some extensive tests of the method have been made. It has been shown to be easily applied to large numbers of subjects and to produce only trivial disability, usually none. There is a demonstrable rise in antibody in from 20% to 70% of persons, the proportion being lower in soldiers than in university students—our two classes of subjects. Two series of experiments have shown that some months after spraying with attenuated virus has been carried out, subjects have a significantly increased resistance to reinfection with the same attenuated virus. Such evidence is far from sufficient to prove that this method of immunization has any useful effect in giving protection against natural epidemic influenza. Only actual experience with a properly controlled series of subjects during an epidemic can answer the question. In 1942 immunization was begun shortly after the start of an influenza A epidemic. The little evidence that was obtained suggested that the immunized had a definite advantage over an approximately equivalent group of controls, but the advantage was not large, and numerous cases of typical influenza occurred amongst the immunized. In 1943 we used a more satisfactory administrative set-up, alternate groups being given type A and type B vaccines, and we changed the A virus used to a slightly more effective strain. In the absence of an epidemic no results were obtained.

I may summarize as follows our current point of view in regard to immunization with living virus:

1. The principle of the method is that which has been used in the great majority of effective immunization methods against virus diseases.
2. The method can be applied at short notice to much larger numbers of subjects than could be treated by the subcutaneous use of concentrated vaccines.
3. It provides the greatest antigenic stimulus to those most in need of protection and can be shown to induce resistance to low-grade experimental infection lasting for some months.
4. Administration of the virus confined to the nasal passages produces less symptoms and probably less immunity than deeper inhalation of the same virus.
5. It has yet to be shown that the intranasal method is an effective immunizing method against natural influenza. Should it prove to be so, it is the most practical method.

6. At a guess, both subcutaneous and intranasal methods would be ineffective against pandemic influenza. Against really virulent influenza the most hopeful procedure would be deep inhalation of living, partly attenuated virus; but this would involve a one or two day attack of mild influenza, a disability justifiable only in the face of a substantial risk.

Primary Atypical Pneumonia.

In America recently I found much more interest, particularly amongst clinicians, in atypical pneumonia than in influenza, and I gather that interest in this group of infections is growing here also.

Atypical pneumonia is the name given to any febrile infection of the respiratory tract which is associated with signs of lung consolidation, nearly always much more readily detected by radiology than by physical examination, and which cannot be shown to be caused by any of the known bacterial or virus pathogens. Amongst the known non-bacterial agents which can produce essentially similar clinical syndromes are the fungus *Coccidioides*, very widespread in the arid south-western areas of the United States, the rickettsia of "Q" fever and the viruses of psittacosis and lymphogranuloma.

As yet there is no certainty that a single aetiological agent is responsible for those cases which are not due to the various organisms I have mentioned; but in America I found a widespread opinion that the great bulk of the cases do in fact fall into a unitary group and that eventually they will be found to have a common aetiology. What interested me even more was the growing feeling that the agent of atypical pneumonia is probably much more widespread than the incidence of frankly diagnosable cases would suggest. No one would be surprised to find that a large proportion of the trivial upper respiratory tract infections, producing a day or two of fever with cough and without clinical or radiological signs of lung involvement, should turn out to be manifestations of infection by the same organism or group of organisms.

The clinical features of the disease are not distinctive. The standard picture is of fever with a gradual onset, cough, practically constant, at first dry but later productive of sputum, headache, malaise and usually chilliness without rigor. Associated coryza or sore throat, or both, is present in about half the cases—in other words, a very ordinary, undistinguished syndrome. Physical signs of consolidation are usually absent or minimal, and the diagnosis must be made radiologically. The leucocyte count is essentially normal; bacteriological study of the sputum reveals only small numbers of normal throat organisms. The fever lasts for a variable period, usually about seven days, but sometimes as long as six weeks; it is uninfluenced by sulphonamide therapy.

The only laboratory test that is yet of any practical importance is the so-called cold agglutinin test. In this serial dilutions of the patient's serum taken twelve to twenty days after the onset are tested in the cold against washed group O human red cells. The serum of about one-third of the patients who have had fever for six days or more is found to have a significantly high titre of 1:32 or over. The cold agglutinin titres follow much the same course as the specific antibodies produced by an infection like virus influenza, beginning to rise about the eighth day and falling after about a month. Possibly due to similar changes in the serum is the puzzling development of non-specific complement fixation with a variety of tissue antigens, notably mouse lung or chick embryo yolk sac tissues.

For diagnosis the main features are: the X-ray findings, absence of significant bacterial pathogens in the sputum, failure of response to sulphonamides, and positive response to cold agglutinin tests in a proportion of the cases.

The chief epidemiological features of the disease as they have been noted in American military and naval establishments are as follows. (1) The incidence of atypical pneumonia tends with great constancy to parallel the general incidence of undifferentiated respiratory infections and to rise to a level of about one-tenth that of the latter. (2) It is predominantly a disease of recruits rather than

seasoned men. (iii) The incubation period is relatively long (eight to twenty days).

Research on the Aetiology of Atypical Pneumonia.

If the hint from clinical and epidemiological experience is correct that atypical pneumonia is merely the most outspoken manifestation of an extremely common infection, which more usually produces only minor undiagnosable illnesses, then it is obviously an important matter to determine its aetiology. Febrile respiratory infections, not influenza, are of more importance in military camps than virus influenza, and if a line of approach to their prevention could be obtained, valuable potentialities would appear.

A great deal of work has been done in America on the assumption that a virus is responsible for atypical pneumonia, and already a wide variety of claimants for the role has been reported. Most of these appear to be contaminant viruses derived from the laboratory animals being used. The work which appears most likely to be fruitful at the present time is that of Eaton and his collaborators. They find that sputum from subjects of atypical primary pneumonia can produce a mild but constant lesion when inoculated intranasally in hamsters. The condition cannot be transferred from hamster to hamster, but the agent can be grown in chick embryos and passed indefinitely from one embryo to another. No visible lesions are produced in the embryos, but the presence of the virus is detected by subinoculation in hamsters.

Such work is a long way from providing even a satisfactory means of aetiological diagnosis, let alone any means by which the incidence of the disease may be reduced. It has not yet been wholly confirmed; but other workers have had rather similar results. Horsfall at the Rockefeller Institute now considers that in addition to a virus like that described by Eaton, a peculiar streptococcus of salivarius type also plays a part in causing the disease.

My reason for discussing atypical primary pneumonia in a talk mainly concerned with influenza is primarily that any investigation of respiratory infections outside the periods of influenza epidemics will always find a large proportion of cases which can be classed with the atypical pneumonias, even if in fact no pulmonary shadows are found by X-ray examination. A proportion of such cases appears to be due to influenza virus infection, more often influenza B than influenza A in my experience, and it is natural therefore to feel that another virus or group of viruses may be responsible for the rest. It does not necessarily follow either that discovery of the aetiology of this group of infections will be followed by any practical approach to their prevention, or that non-specific methods of prevention may not be developed in the absence of aetiological knowledge; but the solution of their aetiology would at least provide a means for accurate epidemiological study and open the way for any laboratory approach to a chemotherapeutic or immunological attack.

Conclusion.

It is easier to be pessimistic than optimistic about the prospect of making any significant progress in reducing the incidence of the general group of respiratory infections with which I have been concerned. At the present time there is a reasonable hope that for special groups under discipline effective methods of immunization against epidemic influenza will be made available. Effective mass immunization of whole populations is another matter. Something would have to be attempted if the 1918-1919 situation arose again; but I am afraid that in such circumstances only makeshift measures would be possible. We must not forget that we have only hypotheses as to the nature of the 1918-1919 pandemic, and that a recurrence might show us something very different from the mild influenza epidemics which alone have been studied since the discovery of the virus. Should it be found that a new pandemic was due to an antigenic type of influenza virus so far unrecognized, it would require a superhuman effort

both in the laboratories and by the administrative health authorities to produce any means of immunization before the pandemic had done its worst.

In regard to the other presumed virus diseases of the respiratory tract—the colds, the nondescript febrile catarrhs and the atypical primary pneumonias—there are no immediate prospects of practical attack. The problem is still to define their aetiology and to elaborate methods for experimental study. For the present they remain inescapable consequences of life in the civilized communities of temperate or cold climates.

But the most exciting thing about medicine today is the unpredictable character of its advances. A mere ten or twelve years ago the sulphonamides, penicillin, typhus and yellow fever vaccines, were not only unknown—they could not even have been predicted in general terms. Research on the respiratory virus diseases must and will continue; but it is not to the mere extension of current lines of work that we can look forward. There are new, unthought-of paths to be opened up, revealed by accidental observation or by wild idea, and from these unlooked-for practical results may spring. In the end we may even find that the common cold is as easy to prevent as cholera, smallpox or plague.

CULTURE OF TUBERCLE BACILLI FROM SPUTUM: REVIEW OF PERSONAL EXPERIENCE OF 310 SPECIMENS.¹

By DAVID B. ROSENTHAL, M.D. (Melbourne), M.R.C.P.,
Medical Superintendent, Gresswell Sanatorium,
Mont Park, Victoria.

In this brief article, no attempt is made to cover fully the subject of the culture of tubercle bacilli. In his monograph on "Studies in Tuberculosis", and elsewhere, Dr. R. Webster⁽¹⁾ has reviewed the subject and reported his results. I am personally indebted to Dr. Webster for advice during the work here outlined, and in general his methods have been adopted.

Technique.

The standard medium used was Petragani's medium, made by the Commonwealth Serum Laboratories, Melbourne. Tubes of Petragani's medium from the pathological departments of the Austin Hospital, Heidelberg, and the Alfred Hospital, Melbourne, were also made available, and a few tubes of Lowenstein's medium were obtained from the Alfred Hospital. No appreciable difference in the results obtained was noted with the different culture media. It was found that the acid technique was more satisfactory than the alkaline technique, the growth of moulds being much less frequent, and less profuse when present, with the acid technique. A small series, in which a 0.1% solution of malachite green was added to the inoculum before incubation with acid solution, gave inconclusive results. For recognition of the neutralizing point, a very small amount of "Brom-Thymol Blue" (British Drug Houses) was added to the acid used, the neutralizing point being strongly marked by the change from light yellow to a well-defined blue colour. The pH range of this detector is 6.0 to 7.6, the upper end corresponding to the optimum reaction for growth of the human variety of tubercle bacilli.⁽²⁾ Incubation was carried out in a standard Thom electric incubator, with a temperature range of 36° to 39° C. The tubes were incubated with cork stoppers, as abundance of air and moisture are essential for growth. Growth in sealed tubes ceases after three to four weeks.

¹ The substance of this article was communicated to the Society of Pathology and Experimental Medicine, Melbourne, on July 12, 1943.

Results.

The results will be considered under three headings: (i) incubation time of tubercle bacilli, (ii) details of inoculated tubes, with reference to other bacteriological findings, (iii) multiple cultures from the same patient.

Incubation Time.

Of the 55 cases, 50 fell in the six weeks' interval, the peak of the curve being about twenty-four days; this is also the average for the group (Table I and Figure I).

TABLE I.

Number of Cases.	Days.
1	10-14
3	15-20
14	20-24
16	25-29
9	30-34
4	35-39
3	40-44
Not shown in the graph (Figure I).	
1	65-69
2	90-94
1	105-109
1	154

Dr. Webster quotes the average in a series of twenty-four cultures as fourteen days.⁽¹⁾ The regularity of the curve is noted. Five cases were well outside the graph, and in these the time observed is well outside the usual limits of six weeks imposed for the "reading" of tubes. Generally, the earlier the appearance of colonies, the more profuse the growth, and many of the late-growing cultures consisted of a single colony, or of a few discrete colonies.

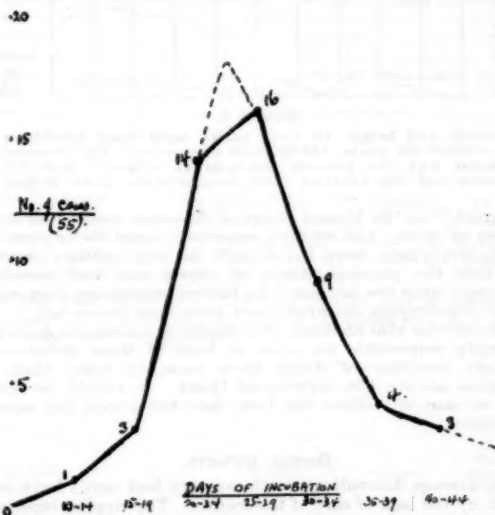


FIGURE I.

Incubation time of tubercle bacilli, in days.

Readings were taken with the naked eye; but careful and regular examinations of the tubes were made. In all cultures, the growth was of the human or eugonic type, and bacilli when examined by the Ziehl-Neelsen method corresponded in appearance to the human strain. Virulence tests with animal inoculation were not carried out. It is noted that the great majority of cultures were first seen well within the period allowed for guinea-pig inoculations to be observed; this is usually six weeks for the subcutaneous route, although if the intraperitoneal route is used, death of the animal may occur in two to three weeks.

Details of Inoculated Tubes.

In Table II, the results of culture are examined in relation to tests by the Ziehl-Neelsen method, both in the same specimen, and in other specimens from the same source. "Positive culture" groups need no special consideration. Group II includes several in which culture of sputum or gastric mucus had yielded a positive finding on another occasion, but in which all Ziehl-Neelsen tests of sputum gave negative results. Group III, although forming only 2% of the series, is obviously of the greatest interest and importance from the clinical viewpoint.

TABLE II.
Details of 310 Inoculated Tubes.

Culture Obtained (55 Tubes).			Culture Not Obtained (255 Tubes).		
Staining by Ziehl-Neelsen Method.	No Staining by Ziehl-Neelsen Method (12 Tubes).		Staining by Ziehl-Neelsen Method.	No Staining by Ziehl-Neelsen Method (217 Tubes).	
	Staining on Other Occasions.	Never any Staining.		Staining on Other Occasions.	Never any Staining.
43	6	6	38	53	164

Group IV needs some attention. Reasons for failure to grow the organisms known to be present may include errors of technique, low viability or death of the bacilli, and absence of bacilli from the inoculum.

Errors of technique include preparation of the inoculum and the medium used. They also include some instances in which rapid overgrowth by moulds necessitated the early discarding of the tubes concerned (about 25%). Smears from all these tubes were examined by the Ziehl-Neelsen method before a final report was made.

With regard to the absence of bacilli from the inoculum—that is, uneven distribution in the specimen used—material for Ziehl-Neelsen staining was selectively extracted from the specimen in the container before the inoculum was prepared for culture, and in many Ziehl-Neelsen "positive" specimens very few bacilli were seen—perhaps only one or two even after careful examination of the whole slide. Group VI includes specimens from cases in which pulmonary tuberculosis was suspected, usually on radiographic evidence, but in which the diagnosis was never established. The proportion of specimens from non-tuberculous sources was probably considerable, but attempted estimation was inconclusive.¹

Multiple Inoculations from the same Patient.

When multiple inoculations were made from the same specimen, in twenty cases the results were consistent. In four cases the results were inconsistent; in three of these instances, one of two tubes yielded a positive result and the other a negative result; in one instance, of four inoculated tubes, one gave a positive result and the other three negative results.

When multiple inoculations were made from the same patient, but from different specimens taken at different times, in 39 cases the results were consistent. In two cases, one of two tubes gave a positive result and the other a negative result.

Thus by the method of multiple inoculations from the same patient, the number of "positive" cultures was appreciably increased. The figures are small, but it would appear that multiple cultures are desirable.

Summary.

1. The average incubation time for tubercle bacilli was about twenty-four days, the earliest being seen within fourteen days.

2. Five of 55 cultures appeared after six weeks, the longest period being about five months.

3. The relationship between the results of cultural examination and other bacteriological examinations is discussed.

¹ At this stage Dr. Rosenthal showed tubes containing colonies of tubercle bacilli.

Acknowledgement.

I wish to express my thanks to my assistant medical officer, Dr. R. Marahman, for his painstaking care in the preparation and microscopic examination of the many stained specimens required during this investigation.

References.

- ⁽¹⁾ R. Webster: "Studies in Tuberculosis", 1942.
⁽²⁾ W. Topley and G. Wilson: "Principles of Bacteriology and Immunity", 1936, page 303.

Addendum.

In the issue of *The Journal of Pathology and Bacteriology* of October, 1942, at page 443, E. Nassau records the results of the addition of 1% blood charcoal to Petragani's medium, modified by the addition of asparagin, with the application of the standard acid technique. It is stated that colonies appear about four or five days earlier, develop in larger numbers and are bigger. It is concluded that charcoal seems to act, not only as a metabolic, but also as a reproductive stimulus of growth of tubercle bacilli on the media used.

THE MEDICAL ASPECT OF NAVAL RECRUITING.

By W. E. ROBERTS,

Surgeon Commander, Royal Australian Navy,
Sydney.

THE medical examination of recruits should be systematic; it then becomes automatic, and there is less likelihood that any defect will be overlooked.

The preliminary investigation as to height, weight, chest measurement and urine having been made and the questionnaire completed, the candidate, stripped, should stand facing the medical officer. He should be in a good light, preferably natural; rashes and skin conditions—for example, jaundice—cannot be appreciated properly in artificial light. Women candidates retain brassiere and pants under a dressing gown. This is removed and the examination is carried out as for men, the brassiere and pants being discarded as required. This method has proved satisfactory to all concerned at this centre.

A table of standard heights and weights will be found most useful. The standard for the navy is, in general, higher than that required for the other services, and I consider that those conducting the examination should have had at least one year's service afloat. It is impossible otherwise for them to appreciate the conditions under which the personnel live, especially in war time. On this account the general practitioner is not so competent to examine recruits for the naval service as for other services.

It must be borne in mind that every candidate for the navy should be fit to go anywhere and do anything under varying conditions of weather and climate. (Apropos of this, I recall an occasion during the present war when extremes of cold and heat were experienced within twenty-one days.)

Every candidate should be examined fully, and this cannot possibly be done properly if the medical officer remains seated throughout. Even if an obvious defect presents itself early in the examination, the full routine should be carried out for the following reasons: (i) The candidate may be fit for some special branch in which the particular defect is not detrimental. (ii) Other defects may be discovered which, with the original defect, render the candidate unfit for any branch of the service. (iii) Full examination is necessary for the purpose of records and the preparation of statistics.

The General Appearance.

With regard to general appearance, observe (i) the pose of the head, (ii) the set of the shoulders, (iii) the inclination of the trunk on the pelvis, (iv) the position of the arms and legs, (v) the outline of the lower limbs.

The skin should be elastic and neither moist nor dry, the muscles moderate in size and of firm texture. With regard to the general build, some are naturally small-boned, others are large-boned; the former type are seen especially among women, and although they are under weight according to standard, they possess muscle of good type.

The obviously emaciated and obese type of recruits should of course be rejected; but there are intermediate border-line types which need careful consideration, and it is with regard to these that muscle-tone, deportment and gait are all-important. In some instances, considerable improvement can be expected during the period of training.

In this connexion I would stress the importance of gait. A slovenly gait is difficult to eradicate; some people are incapable "of picking up their feet", and these should always be rejected.

Discard any candidate whose belly girth exceeds his maximum chest girth.

The feet should be mobile, and any rigidity is a cause for rejection. Arches (longitudinal and transverse) should be present; but more important is the muscle-tone of the legs—this should invariably be good. The soles of the feet must always be examined.

Contrary to popular belief, the Australian male is not a superman. The magnificent specimens seen on the beaches (life savers) and football fields are not representative. Examination of a cross-section of the spectators at a large race meeting, at Bondi beach, or at a Rugby League football match would reveal that for males between the ages of seventeen and twenty-six years—a period during which the male should be at the peak of his form—the average height is five feet seven and a half inches, the average weight 142 pounds and the mean chest measurement 34 inches. Considering the abundance and variety of food, the unrivalled opportunities for sport of all kinds and the almost perfect weather conditions prevailing in Australia, one would expect the average to be of a higher standard. Apart from this, many possess defects due to improper feeding in childhood and to lack of drill in youth. It is interesting to note in this connexion that since the introduction of food control (balanced diet) in England, there has been a great improvement in the general health of the people.

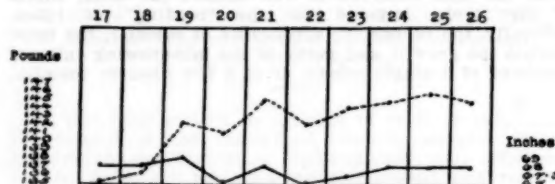


FIGURE 1.

Weight and height of 1,000 males aged from seventeen to twenty-six years, 100 in each age group. The average weight was 142 pounds, the average height 5 feet 7.6 inches and the average chest measurement 33.98 inches.

Perrott,⁽¹⁾ in the United States of America, states that some 28 out of every 100 recruits examined, aged twenty-one to twenty-five years, were found unfit for any military service, and that the physical status of young men had remained stationary since the last war; he further emphasizes that many of the impairments detected could have been prevented.

It is obvious that abolition of compulsory training in Australia is largely responsible for some at least of these defects—for example, scoliosis—of which there were no fewer than 36 examples among 156 deformities listed. It should be noted that no case of scoliosis has been detected among the women candidates.

Dental Defects.

The average Australian's teeth are very bad, and I have been struck by the lack of care of the mouth. This applies especially to the males, some of whose mouths are shockingly neglected. The females invariably possess cleaner mouths, and the majority have a greater regard for personal hygiene.

All this points to insufficient training during childhood and adolescence; the primary responsibility is parental, but later responsibility belongs to the schools, in which instruction and supervision have been lacking. To illustrate this, of 1,360 candidates finally rejected, no fewer than 201 were rejected for dental defects; many required extensive repairs, extractions and dentures. So much was this the case that, although otherwise fit, they could not even be deferred (time factor).

Hovell,⁽²⁾ in the United States of America, on the subject of dental sepsis in recruits, has this to say: "The need for dental attention is still great, in spite of the school dental service and attempts to educate children in oral hygiene." He emphasizes that the break in dental supervision after leaving school allows

a retrogression in oral well-being. He remarks, however, that the modern recruit is better off than his predecessor, in that there is now an Army Dental Service, which was instituted after the last war.

TABLE I.
Average Australian Vital Statistics.

Subjects.	Height.	Weight (Without Clothes).	Mean Chest Measurement.
1,000 males, aged 17 to 26 years ..	5 feet 7.5 inches	142 pounds	34 inches
1,000 females, aged 18 to 27 years ..	5 feet 3.5 inches	115 pounds	33 inches

Visual Defects.

With regard to visual defects, it must be remembered that the standard required for the navy is a high one, especially so for the seaman branch; consequently the high percentage of rejections, some 25%, is more apparent than real. In connexion with colour vision, it is interesting to confirm that few if any cases occur among women.

Pulmonary Tuberculosis.

All candidates for the Naval Service undergo radiographic examination of the chest before acceptance. In the series under review there were thirteen cases of pulmonary tuberculosis, seven among males and six among females. Tables setting these out in detail are given (Tables II and III). These tables emphasize the importance of miniature mass radiography in the detection of lesions in the early stages, enabling the subjects to have effective treatment, and in the prevention of spread to others in the community.⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁷⁾⁽⁸⁾⁽⁹⁾ In addition, the country benefits financially by the elimination of prolonged periods in hospital and of pensions. Miniature mass radiography is now an essential part of preventive medicine, and in England steps have already been taken to apply it to the civil population; centres are in operation there in the large provincial cities. An article relating to this matter appears in the *British Medical Journal* of May 8, 1943. Although the initial expenditure for such a scheme must be considerable, it will more than pay for itself in the long run.

Comment.

These records have been taken from 5,624 recruits (4,769 male and 855 female) examined during a period of twelve months. The ages of the candidates ranged from seventeen to fifty-eight years for males and from eighteen to forty years for females; all branches of the service are represented.

Of the male candidates 1,218 were rejected and of the female candidates 142; the total number of rejections was thus 1,360 out of the 5,624 candidates.

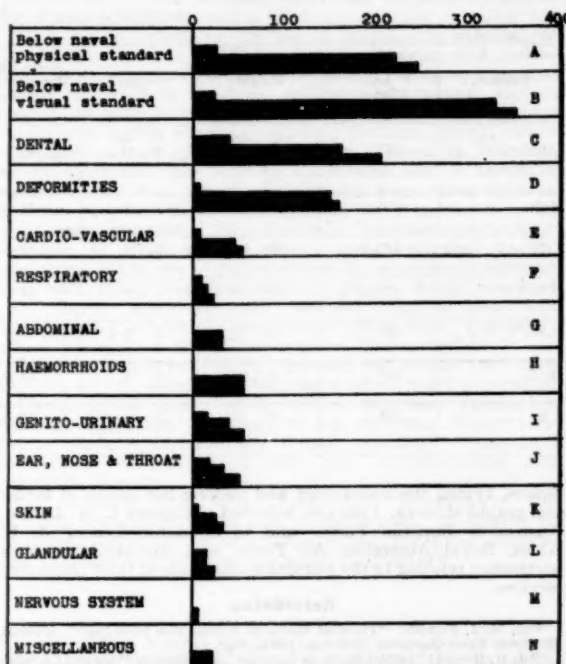


FIGURE II.

Analysis of rejections for one year (1,360), 1,218 being amongst males and 142 amongst females. A: Under weight, height and chest measurement, and poor muscle tone. B: Defective vision, colour blindness, blepharitis, cataract, pterygium, strabismus, ocular torticollis. C: Dental caries, gingivitis, pyorrhea, insufficient teeth. D: Scoliosis, lordosis, kyphosis, spondylolisthesis, missing digits, Dupuytren's contraction, genu valgum, genu varum, pes planus, pes cavus, hallux valgus, hammer toes. E: Murmurs (acquired or congenital), hypertension, varicose veins. F: Bronchitis, bronchiectasis, pulmonary tuberculosis. G: Hernia (inguinal or umbilical). H: Hemorrhoids (bleeding or protruding), history of hemorrhoids. I: Absence of kidney, pyuria, varicocele, hydrocele, undescended testes, salpingitis, dysmenorrhoea, Bartholin's cyst. J: Enlarged tonsils, recent mastoiditis, otorrhoea, defects of speech. K: Occupational dermatitis, acne vulgaris, tinea, psoriasis, extensive keloid. L: Obesity, thyreoid enlargement. M: Neurosis, migraine. N: History of hepatitis, gastric ulcer, rheumatism, recurrent malaria, amebiasis.

Acknowledgements.

My thanks are due to Surgeon Captain W. J. Carr, C.B.E., F.R.A.C.P., Director of Naval Medical Services, for permission to publish this article, and to S. B. A. Leary for help in checking

TABLE II.
Females.

Subject.	Age. (Years.)	Weight.	Height.	Mean Chest Measurement. (Inches.)	Development.	Radiological Findings.	Remarks.
P.B.	29 ¹¹ / ₁₂	st. lb. 8 1	ft. in. 5 4.5	32.5	Good.	Focus right upper lobe; small focus left upper lobe.	Not suspected.
E.C.	21 ¹¹ / ₁₂	10 8	5 6	34.0	Good.	Lesions both upper lobes, chronic type.	Not suspected.
G.D.	19 ⁹ / ₁₂	7 10	5 0	33.0	Fair.	Chronic lesion in left upper lobe, some activity.	Suspected.
B.F.	20	8 0	5 3	32.0	Fair.	Lesion right upper lobe, fibrosis active.	Suspected.
M.K.	23 ¹⁰ / ₁₂	8 5	5 7	31.0	Good.	Lesion right upper lobe, small cavity active.	Not suspected.
F.M.	22 ⁷ / ₁₂	7 2	5 3	30.0	Fair.	Advanced tuberculosis, chronic type, both upper lobes; early cavitation.	Suspected.

TABLE III.
Males.

Subject.	Age. (Years.)	Weight.	Height.	Mean Chest Measurement. (Inches.)	Development.	Radiological Findings.	Remarks.
S.J. . . .	33 ¹ / ₁₂	st. lb. 13 9	ft. in. 6 0	40-0	Good.	Tuberculous lesions right apex and clavicular regions, chronic in type, but some activity present.	Not suspected.
McR. . . .	29 ⁴ / ₁₂	11 6	5 11.5	34.5	Moderate.	Chronic lesion right apex, infra-clavicular; slight activity present.	Not suspected.
T.T. . . .	43 ² / ₁₂	10 11	5 6	37-0	Good.	Tuberculosis, chronic in type, involving both upper lobes.	Not suspected.
O'R.W. . .	16 ² / ₁₂	9 3	5 8	33.5	Good.	Small lesion, chronic type, right hilum.	Not suspected.
B.W. . . .	48 ² / ₁₂	9 2	5 9.5	35-0	Fair.	Lesion left upper lobe, very chronic type, little activity present.	Suspected.
McJ. . . .	56 ² / ₁₂	8 10	5 8	33-0	Poor.	Tuberculous lesions left upper lobe, chronic type, active.	Suspected.
S.R. . . .	48 ⁴ / ₁₂	12 2	5 8.5	39-0	Good.	Lesions, chronic in type, involving both upper lobes.	Not suspected.

figures, typing the manuscript and making fair copies of tables and graphs *et cetera*. I am also indebted to Captain C. W. Davies, Australian Imperial Force, and to Squadron Leader A. E. Khan, Royal Australian Air Force, who furnished me with particulars relating to the recruiting standards of their respective services.

References.

- ⁽¹⁾ G. St. J. Perrott: "Physical Status of Young Men 1918-1941", *Milbank Memorial Fund Quarterly*, October, 1941, page 127.
- ⁽²⁾ J. H. Howell: "Dental Sepsis in Recruits", *The Medical Press and Circular*, February 5, 1941, page 119.
- ⁽³⁾ R. H. Britton and G. St. J. Perrott: "Summary of Physical Findings on Men Drafted in the World War", *Public Health Reports*, January 10, 1941, page 41.
- ⁽⁴⁾ R. Spillman: "The Value of Radiography in the Detection of Tuberculosis in Recruits", *The Journal of the American Medical Association*, October 19, 1940, page 1971.
- ⁽⁵⁾ A. D. Leigh: "The Detection of Pulmonary Tuberculosis in Army Recruits", *Tubercle*, May, 1941, page 121.
- ⁽⁶⁾ B. P. A. Stuart: "Mass Radiography of the Chest", *THE MEDICAL JOURNAL OF AUSTRALIA*, July 12, 1941, page 27.
- ⁽⁷⁾ B. White: "Mass Radiography of the Thorax with Special Reference to its Application to Recruits for the Army", *THE MEDICAL JOURNAL OF AUSTRALIA*, July 12, 1941, page 23.
- ⁽⁸⁾ P. Ellman: "Mass Radiography in the Early Detection of Intrathoracic Disease (with Special Reference to Pulmonary Tuberculosis in Recruits)", *Proceedings of the Royal Society of Medicine*, July, 1941, page 595.
- ⁽⁹⁾ Ministry of Labour and National Services: "Report of Medical Advisory Committee on the use of Mass Miniature Radiography in the Detection of Pulmonary Tuberculosis among Recruits in His Majesty's Forces", 1942.
- ⁽¹⁰⁾ E. N. Chamberlain: "The Recruit's Heart", *British Medical Journal*, March 8, 1941, page 354.
- ⁽¹¹⁾ N. Y. Youngman: "The Psychiatric Examination of Recruits", *THE MEDICAL JOURNAL OF AUSTRALIA*, March 7, 1942, page 283.
- ⁽¹²⁾ C. L. Wittson, H. I. Harris and W. A. Hunt: "Detection of the Neuro-psychiatric Unit", *United States Naval Medical Bulletin*, Volume XI, April, 1942, page 340.

CLINICAL IMPRESSIONS OF SKIN DISEASE IN A
TROPICAL OPERATIONAL AREA.

By W. KEITH MYERS,

Major, Australian Army Medical Corps.

THE following article is an attempt to group the more common dermatoses encountered at an Australian general hospital in a tropical area, and briefly to discuss in general terms their incidence, some features in their clinical appearance, and their treatment.

A general discussion of skin disease as seen in army practice in the tropics must take into consideration such influencing factors and subjects as the following: climate, its effect on the clinical appearance of the disease, and its effect on treatment; diseases seen mainly in the tropics; available drugs and physiotherapeutic equipment; the effect of coincident general diseases; and finally, the effect of army conditions and requirements on otherwise comparatively simple disease. Some of these factors will be discussed in relation to the subsequent analysis.

For the purpose of simplifying treatment and easing the work of both the dispensary and the nursing staff, a standard pharmacopoeia was drawn up, which comprised adequate, simple and well-tried remedies. The list was quite a full one, and covered all but a few contingencies. X-ray therapy was kindly made available by the commanding officer of another hospital. As skin disease was rife in wards other than those set aside for dermatological conditions, a copy of the guiding principles in the treatment of the earlier and simpler conditions was issued to each of these wards, a measure designed to start treatment on the right lines, coincidentally with the treatment of the patient's other condition. This precaution often avoided later transfer of the patient, except in the more serious types of cases. Patients who relapse, both within the hospital and after their discharge, are always a problem in the army, and far more so in the tropics. Thus the period of stay in hospital or in a convalescent depot tends to be prolonged; but a few days spent thus may save weeks later. Inevitably, though, at times the pressure of admissions did not allow of this. Unfortunately, under the conditions existing, it was impossible to estimate the true relapse rate, since a patient was often admitted to another medical unit.

In the first few weeks it became obvious that the clinical entities encountered tended to group themselves into several well-defined categories. Accordingly five groups were set out for statistical purposes, as follows: ringworm (mycotic) infections, pyogenic infections, acne, dermatitis (all types) and miscellaneous dermatoses. Taken over a period of four months, the average respective percentages of the total number of "skin patients" discharged from hospital were as follows: 34, 25, 3, 22, 16.

The highest peak incidence of patients with skin diseases in hospital at one time during that period (officers, dermatological patients in other wards and out-patients excluded) was 151. This represented a percentage of nine of the total bed state of the hospital. In a slack period the total number of dermatological patients was 109, representing 11% of the total bed state. In the four months' period on which this report is based, approximately 550 patients were admitted or transferred to the dermatological wards.

It is convenient to deal in detail with the groups *seriatim*.

Ringworm Infections.

By far the most common type of ringworm infection was a generalized, rapidly spreading circinate infection, often involving, too, the upper portions of the thighs and the genito-crural folds, but commonly not affecting the interdigital spaces of the feet. Though usually responding fairly well to treatment by the dyes (in the form of a modified Castellani's paint) and a broken-down type of Whitfield's ointment (in the form of a paste), some infec-

tions were very resistant, became easily eczematized even with care in treatment, and eventually were characterized by follicular pustular infection and nodularity. The usual length of stay in hospital was some three weeks for the superficial types of infection, but in the resistant cases the period was extended to six or seven weeks. Later X-ray therapy, or the application of weak chrysarobin ointment, was of value.

Intertriginous foot ringworm usually became infected and very dirty, and associated with eczematization of the dorsum of the foot. Mild sedation with the application of wet dressings of saline solution, lead lotion, boric acid *et cetera* was of value, aided by X-ray therapy. Stronger fungicidal treatment had to be well delayed.

Unfortunately, owing to pressure of work in the laboratory, a serious effort to cultivate and classify the fungi concerned was not made, although in several cases cultures of the trichophyton or epidermophyton were obtained on Sabouraud's medium.

No undoubted clinical example of *tinea imbricata*, seen so commonly among the natives, was noted in the troops in this particular hospital.

Several examples of nodular ringworm of the beard, and one case of kerion of the scalp, were encountered. X-ray epilation was not required, the lesions settling down with slight resultant scarring and alopecia, under the influence of wet antiseptic dressings applied locally, and potassium iodide given by mouth when the lesion was very nodular.

An interesting feature noted was the effect of coincidental malaria or incipient scrub typhus. It was often found that a patient suffering from mycotic infection, responding poorly to treatment, would in a day or two often develop malaria. When the latter was under control with routine treatment the skin condition would once more respond, though perhaps slowly at first. The same applied to other skin affections, particularly dermatitis.

Of other fungous infections, *pityriasis (tinea) versicolor* was interesting, as it showed itself as an achromatic form on a brown skin. Scaliness was often so slight as to cause a resemblance to vitiligo (leucoderma). The microscope, of course, established the diagnosis. The condition was usually much more resistant to treatment than in temperate climates.

Microsporon minutissimum, the organism of erythrasma, was isolated in a few instances from cases in no wise resembling this disease clinically.

Pyogenic Infection.

Two outstanding types of pyogenic infection were met with, apart from secondary infection of other dermatoses. The first of these was *impetigo bullosa*, which is a common disease in tropical areas. Sometimes preceded by *miliaria rubra* (prickly heat), sometimes appearing *de novo*, it took the form of discrete, rounded, tense, thin-roofed blebs, at first clear, but rapidly becoming purulent. At this stage treatment was simple. But often, through neglect or lack of facilities, the blebs ruptured, the lesions became confluent, and a messy crusted impetigo resulted. The sites of election were the axillae, the genito-crural folds and the abdomen, but generalization was not uncommon. General symptoms were absent in most cases. Autoinoculation was frequent. In the cases in which culture was attempted, only the staphylococcus was isolated, although typical *impetigo contagiosa* was sometimes also present on the face. Application of the dyes in early cases, and of wet antiseptic "soaks" and baths in the more confluent types of lesion, followed by the use of 2% ammoniated mercury paste, were usually sufficient to clear the condition in eight or ten days. Relapses, probably due to reinfection, were not uncommon. Hidradenitis (sometimes suppurative) of the axillae occasionally followed, and usually responded well to treatment by fomentations and later to X-ray therapy. Sulphonamides were not used. Brief reference will be made later to the subject of local sulphonamide therapy.

The second type of infection seen was multiple ecthymatous ulcer, the so-called "desert sore", "Syrian sore" or "Wog sore". It is sometimes erroneously designated

tropical ulcer. True tropical ulcer was not seen in any of the troops admitted to this unit.

It is not proposed to discuss at length the aetiology of the ecthymatous sore. Many diverse theories and causes have been propounded. It is sufficient to state that the lesion is common in most military campaigns, and is associated with lack of proper washing facilities, arduous conditions, minor trauma, irritating clothing, sweat, insect bites and mixed pyococcal infection. Even in hospital, where attention was paid to cleanliness and a carefully balanced diet was chosen, the lesions were often slow in healing, and individual differences in the response to treatment were common. The treatment adopted was merely the use of local wet dressings and medicated pastes. Occasionally the use of hypertonic sodium sulphate solution and red lotion were of value. Unna's paste was not particularly well tolerated in the tropics, nor was "Elastoplast" occlusion treatment. Mite bites ("Mokka" bites) were often the starting point of the lesions.

Other pyogenic conditions included folliculitis (not true sycosis) of the beard or other hairy parts, several cases of indolent groin ulcers with mixed infection (including *Bacillus coli*), and one case of leg and foot ulcers (the flexor tendons of the toes being exposed). The last-mentioned ulcers resisted both local sulphonamide and penicillin therapy.

One case of cutaneous diphtheritic infection of the genitals was met with in the whole period. Response to treatment by injection of antitoxin and the local application of proflavine powder was most satisfactory.

Acne.

Acne was much aggravated by tropical service in many instances. The disease, from being a minor one, in several cases spread widely to areas not usually affected, such as the buttocks, thighs and legs, and even to the axillae. It was commonly of the nodular and discharging cystic type.

The spread dated from the time of the patient's arrival in the tropics or several months later. It was occasionally a distinct disability to the soldier, and reclassification was required, often with the recommendation that his service be restricted to a temperate climate only.

Dermatitis.

The cases of dermatitis, in general, were the most disappointing of all those treated. In many instances, once the reaction of dermatitis had shown itself, the tropical conditions were most unsatisfactory for its amelioration. It is in this group of cases, particularly those in which the dermatitis was of a generalized type, or affected the legs, that a reallocation of the patient was essential; again it was frequently necessary to evacuate the patient from the tropics. Relapses were frequent. In some cases (as far as subsequent observation was possible) X-ray therapy was of distinct value in the effecting of a permanent cure; but generally this was so, it would appear, mainly in the localized variety of dermatitis, of an originally pyococcal or mycotic origin. In the majority of other cases, distinct improvement followed X-ray therapy. But it must be pointed out that tropical conditions again proved the main handicap against its full efficacy. Added to this, when the leg is affected, the nature of a soldier's occupation is a distinct bar to permanent cure while he is on service. So it is manifestly unfair to judge X-ray therapy by its results in army practice. However, when all factors are taken into consideration, it proved of distinct therapeutic value.

A common clinical condition encountered was one of trauma, infection and subsequent "infectious eczematoid dermatitis" of the lower limbs. Besides having to endure much irritation, caused by treatment under most adverse conditions, many of these patients were treated with sulphonamides applied locally or generally, or acriflavine solution locally, or both together, for some considerable time. On their arrival at hospital, they presented in addition to a severe flare-up of the local originating lesion a widespread toxic eruption of body and limbs, frequently associated with a severe cheilopompholyx and vesiculobullous eruption of the feet, with oedema. Severe generalized patchy weeping eczema also occurred. It was

difficult to assess the relative parts played by septic tissue absorption, sulphonamide absorption or sensitization to flavine, and also the role of solar radiation.

Frequent articles have appeared in the medical literature in the last year or two concerning the uses of sulphonamides in dermatology and untoward sulphonamide reactions following both local application and ingestion. The need for great care in the local use of acriflavine or the sulphonamides cannot be sufficiently stressed, and in the author's opinion such treatment should be avoided once sensitivity in the form of local dermatitis is evident, from whatever cause. A simple potassium permanganate, boric acid or saline dressing applied locally is often of great benefit, and can certainly do no harm.

A practical difficulty in the treatment of dermatitis in the tropics is the intolerance of the skin to greasy preparations, even 50% pastes. This renders treatment in the forward areas a matter of great difficulty. It also means that in hospitals wet dressings or baths are essential, and when large numbers of men require treatment, a constant strain is imposed on the nursing staff.

In the treatment of dermatitis, coincidental tropical fevers again were seen to play their retarding part, and obviously by mutual antagonistic processes greatly added to the difficulty of nursing.

Recurrent cheilopompholyx is discussed here, although in uncomplicated cases it has been grouped under the heading "miscellaneous" for statistical purposes. In most cases mycotic infections of the feet were absent, and scrapings of the hands showed no evidence of fungus. A search for foci of sepsis was often disappointing. Apart from those cases described, in which the lesion was part of a toxic eruption, it would appear to be a condition the cause of which is as yet undiscovered. Many writers are inclining once more to the "dysidrosis" theory, and this seems to offer some explanation in the tropics, where cheilopompholyx is undoubtedly more frequent. X-ray therapy was a most useful adjunct in its treatment.

A further point in the discussion of dermatitis should be mentioned. No cases whatever were encountered here conforming to the full clinical picture of the so-called chrome dermatitis seen both in the temperate zones and in the Middle East. The author is convinced that these cases were clinical entities. In one or two cases here suspicion was aroused and patch tests with shirting material were carried out, with negative results. This is obviously a field for further investigation.

One or two freak conditions were encountered. Among cook-house personnel, a condition of *dermatitis venenata* occurred in men who, after peeling parsnips, or coming in contact with the scrapings or washing water, developed an acute reaction on the parts affected when subsequently exposed to sunlight. A minute trace only sufficed to produce the reaction, which consisted of large bullæ, or red-brown inflamed streaks, or both, where the washings had run over the skin. It was not merely an idiosyncratic phenomenon, as any person could be rendered sensitive. Several members of this unit were admitted to hospital for treatment after dealing with a shipment of fresh parsnips; the warrant officer caterer was greatly perturbed at the temporary depletion of his staff. A great deal of clinical and experimental work has been carried out by Colonel J. C. Beliaario on the subject of this eruption caused by parsnips, and a fully detailed report and paper with references will be published by him at a later date.

Miscellaneous.

Under the heading "miscellaneous" are grouped a few conditions worthy of discussion.

Scabies.

As was expected, scabies was a comparative rarity. It occurred mainly in newcomers to the tropics, or in men recently returned from leave. It was not uncommon, however, in the native population.

Psoriasis.

Psoriasis was most uncommon. Apart from the fact that there was a possible weeding-out of patients before

they went to a tropical area, those patients who were seen were mildly affected, and generally responded rapidly to treatment.

Miliaria Rubra.

Miliaria rubra (prickly heat) was so common as to be almost universal. The degree of incapacity and of subjective symptoms varied in different individuals. Regulation of fluid intake, avoidance of hot drinks, together with local sedative applications, helped the condition; but in many cases the condition was highly resistant, and became easily eczematized and secondarily infected, sometimes with subsequent furunculosis. The disease was most common in the rainy season.

Urticaria.

Urticaria was comparatively infrequent in its chronic form. The giant type was seen in some cases. A search of the faeces to eliminate helminthiasis was necessary. A type of urticaria due to irritation by the barbed hairs of the woolly caterpillar was occasionally seen. It occurred, of course, solely on the areas of contact with the creature.

An Undiagnosed Eruption.

One further most interesting clinical entity remains to be discussed; whether or not it is an aberrant form of *lichen planus* has yet to be decided. If this is so, then the incidence of this disease is higher in this area than would be expected. Several patients were from time to time admitted to hospital suffering from a purplish, nodular eruption, often affecting areas of the body frequently picked out in *lichen planus*. The condition was chronic, and resisted treatment. Varying degrees of pruritus were met with, often less severe than that accompanying classical *lichen planus*. Though some undoubted cases of this latter condition did occur, in many of the above-mentioned cases the primary polished flat papule so typical of the disease was not found. In general the lesions were plaque-like or rounded, sometimes cornified or scaly, and they resembled the hypertrophic lesions seen usually on the lower limbs in undoubted cases of *lichen planus*. However, the white spots and streaks on the oral mucosa were not uncommonly seen. In some cases linear streaking of the upper eyelids was present.

In a few cases there was a history of a dry, horny thickening of palms and soles with painful flexural fissuring and adherent peeling of skin, which had occurred sometimes weeks or months prior to the more generalized eruption. In some cases acuminate follicular lesions (*lichen plano-pilaris*) were found. Histologically, in some cases, a typical picture of *lichen planus* was seen; in others the picture, though suggestive, was not quite typical. Further elucidation is required of this disease, which has become increasingly common.

Comment.

A few more points of general interest remain for discussion.

A diagnostic stumbling-block of an unusual type was encountered. In many pruritic skin diseases, as is well known, eosinophilia is discovered when a differential leucocyte count is made. This feature was complicated by the fact that some patients suffered from ankylostomiasis or other worm infestation, so that eosinophilia could not be dismissed lightly. An interesting example was seen in one patient suffering from *dermatitis herpetiformis* (Dühring's disease). The eosinophile count was over 20%, conforming to the picture of the disease. An attack of diarrhoea necessitated his transfer to a dysentery ward, where he was found to be also suffering from both hook-worm infestation and amebiasis.

Conclusion.

In conclusion, it will be seen from the figures quoted that skin disease in a tropical area of operations is far from being a minor problem. Compared with that of the Middle East campaign, the incidence would seem to be much greater, and the difficulties in treatment far more formidable. Personal experience in both theatres of war

has confirmed this belief. Endemic tropical skin disease is, however, rare among the troops in the area.

Summary.

1. A brief description has been given of the types of skin disease met with in the tropics among members of the armed forces. Grouping of diseases has been attempted, and some approximate figures have been quoted.
2. The clinical features of several of the diseases have been discussed, together with some of the effects of climate.
3. A few points regarding treatment, management and disposal have been mentioned briefly.

Acknowledgements.

The author's thanks are due to the Director-General of Medical Services for permission to publish this article.

Reports of Cases.

FOREIGN BODIES OF THE GASTRO-INTESTINAL TRACT.

By C. H. WESLEY,
Sydney.

RECENTLY I removed a bobby-pin from the duodenum of a child, aged two years. The X-ray appearances were such that the sharp ends of the bobby-pin seemed to have perforated the duodenum and be lying near the *foramen epiploicum*. The duodenum of a child of this age would be about one-sixth the size of a duodenum of an adult, so a bobby-pin in the duodenum of this child would be in size comparable to something much larger than a dinner fork in an adult's duodenum; a dinner fork is 7.5 inches in length. The multiple curves of the bobby-pin make it difficult for the duodenum to pass it on. A nail two inches long passes with much less difficulty.

One authority considered that a bobby-pin, when it reached the duodenum, should be removed immediately, as it would not pass further. Gross and Ladd, of the Harvard Children's Hospital, consider that it should be removed if it has remained in the duodenum one week.

I thought it would be interesting to look up records of patients with foreign bodies in the gastro-intestinal tract who had been admitted to the Royal Alexandra Hospital for Children during the last period of ten years ending November, 1943, and in particular I sought information on the behaviour of bobby-pins.

During this period 64 cases of gastro-intestinal foreign bodies were dealt with, and 120 cases of respiratory and oesophageal foreign bodies. This probably means that many children swallow foreign bodies which are passed unnoticed, while foreign bodies in the oesophagus and respiratory tract soon make their presence known.

Eight foreign bodies were removed at operation; there were no deaths. The following is a summary of the cases in which operation was performed.

Case I.

A bobby-pin was removed from the duodenum of a child, aged two years, after having been present for ten days. At operation the bobby-pin was found to have the curved end cranially; the X-ray picture showed the points to be lying cranially. The child had no symptoms prior to operation and made an uneventful recovery.

Case II.

A bobby-pin was removed from the duodenum after being present for seventy days. There had been a previous attempt at removal in the country; the child collapsed during the anaesthesia and the operation was not completed.

Case III.

A bobby-pin was removed forty-two days after it had been swallowed.

Case IV.

A bobby-pin was present for six weeks and was then removed from the duodenum.

Case V.

A halfpenny piece was removed from the stomach after being present for ten days. The child vomited and suffered severe pain.

Case VI.

A bristle caused acute appendicitis.

Case VII.

An ordinary pin perforated the appendix, causing symptoms of acute appendicitis.

Case VIII.

A child was known to have swallowed a pin; it gave her no discomfort. The pin was found with the head towards the tip of the appendix, causing little if any trouble. The child had no symptoms. An X-ray examination before operation revealed the pin.

Other Foreign Bodies Swallowed.

The following is a list of the foreign bodies swallowed: two open brooches, two closed brooches, six nails some two inches in length, seven bobby-pins, the head of a toy horse, a "Meccano" wheel, seven halfpenny pieces, two farthings at once, six open safety-pins, three closed safety-pins, a screw, a piece of glass measuring three-quarters of an inch by three-quarters of an inch and irregular in shape, a button with a shank, one florin, a nail file, two needles, a picture screw, a key, two penny pieces, a tin whistle, a screwdriver three inches in length, a bristle, one shilling piece, a badge the size of a shilling piece, a sixpenny piece, a drawing pin, six ordinary pins, a tack. No case of trichobezoar from hair chewing was in the series. There were no deaths. The average age in all cases of swallowed foreign bodies was 3.7 years; the incidence was equal in both sexes.

Two bobby-pins were passed on the ninth day; one was passed on the forty-ninth day, although a laparotomy had been performed when the bobby-pin had passed to the small intestine. The penny came through in six days, the picture screw in one day, the tin whistle in six days, the screwdriver three inches in length in four days, a closed safety-pin in two days, a halfpenny in twelve days, a shilling in eight days, an open safety-pin in eight days, an open brooch in two days, another brooch in two days, a two-inch nail in seven days, a needle in six days, other nails in two and three days, the two farthings in thirteen days, a one-inch nail in one day, a screw in three days, a piece of glass in five days, another open safety-pin in eight days, a two shilling piece in thirty-seven days, the head of a toy horse in six days.

A number of patients were discharged from hospital before the foreign body was passed. There is no record in the histories of when these were passed.

Symptoms.

There was in nearly all cases complete absence of symptoms; in others colicky pain and some abdominal tenderness were present. Symptoms were noted in the case of the tack, the irregular piece of glass, the halfpenny *et cetera*. The presence of blood in the faeces was not noted in any of the histories.

With the exception of a pin perforating the appendix, in no other cases did perforation occur. Even when perforation does occur, it is so gradual and the perforation is so well sealed by adhesions that absence of symptoms is the usual feature, except in the case of a foreign body in the appendix. The chief point is that the foreign body was known to be swallowed. In one case a mother brought a child to hospital because he had swallowed sixpence; he was admitted for X-ray examination, and at the end of two days he confided in the resident medical officer that he had spent the sixpence and told his mother that he had swallowed it. Practically all foreign bodies are revealed by X rays.

Treatment.

The treatment is masterly inactivity, with careful checking of the progress of the foreign body by means of X rays. Some patients were given cotton wool by the mouth. Paraffin oil and paraffin oil emulsion were the only aperients allowed. In some cases an enema was given, to retrieve or search for the foreign body. The only drugs ordered—and that somewhat recently—were belladonna and "Eumydrine". In the diet bread and butter and porridge were given, to form a bolus. Agar agar, "Normacol" and banana are advised, but they have not been used in this series.

Prognosis.

The prognosis appears to be good in all cases. If a foreign body is injuring the appendix, it soon makes itself evident, when a routine appendicectomy is carried out.

It may be a wise precaution to remove a bobby-pin after one week; but it appears that it can remain much longer without risk, and be passed naturally.

If the radiographer considers that perforation has occurred, then his advice must be taken, even though there are no clinical symptoms to support the belief.

If an object can be swallowed, the intestinal tract is capable of passing it on, negotiating the pylorus, the duodenal junction and the ileo-caecal valve.

I recently heard of a child, aged two years, who had been treated for a long, puzzling illness; at the post-mortem examination a bobby-pin was found. There was no history of the child's having swallowed a foreign body.

Bibliography.

W. E. Ladd and R. E. Gross: "Abdominal Surgery of Infancy and Childhood", 1941.

Addendum.

After this report was written, a girl, aged two years, was admitted to the Royal Alexandra Hospital for Children on November 16, 1943. An X-ray examination before her admission and on November 17 showed a bobby-pin in the duodenum. The mother had put a bobby-pin in the child's hair, and found later that it was missing. The bobby-pin was shown by X rays to be in the duodenum on November 15. After her admission to hospital, the child appeared nauseated; she was given an injection of atropine and "Eumydrine" was administered. Next day she developed a whoop, and pertussis vaccine was ordered. I last saw her on December 2, and the mother showed me the bobby-pin. The child had shown no symptoms due to the bobby-pin and was recovering from whooping cough. This child swallowed the bobby-pin on October 30 and passed it on November 28—that is, in twenty-nine days.

Reviews.

THE IDENTIFICATION OF INSECTS OF MEDICAL IMPORTANCE.

THE book by Dr. John Smart on the identification of insects was written to bring technical aid to entomologists, medical men and sanitarians, so that with as little difficulty as possible they might be able to identify insects and arachnids of importance to the old world in medicine or in hygiene when met with, particularly under conditions which of necessity curtail facilities for the identification of specimens by specialists, or for obtaining the necessary literature dealing with identification.

The first chapter is an introduction to the structure of insects, their development and life history, classification and nomenclature, zoogeography, and is followed by a chapter on structure, life history and classification of the Diptera. There is a key to the families and a simplified key restricted to the families of blood-sucking Diptera. Morphological notes are given on the families of the Nematocera of medical importance, excluding the mosquitoes, and on the Tabanidae with a key to the more important genera of the Tabanidae. Brief notes are given on several families of the Diptera Cyclorrhapha. The family Muscidae (house flies *et cetera*) is dealt with more fully with keys to the genera of medical importance. A key is given for separating the various species of Glossina. There is a key to the genera of importance in the family Calliphoridae (blowflies) with notes on these genera. The larvae of myiasis-producing Diptera are dealt with firstly in a table giving a list of the myiasis-producing larvae, notes on these larvae follow, and then there is a key for the identification of larvae from cases of myiasis. The section dealing with the Culicidae or mosquitoes

occupies more than one-third of the book. There are keys to the subfamilies of the Culicidae and the tribes of the Culicinae; then follow notes on the preparation and examination of mosquitoes. *Culex fatigans* Wiedemann, *Aedes aegypti*, *Aedes scutellaris* and *Aedes albopictus* of the tribe Culicini are briefly described and the diseases conveyed by them mentioned. Next follow keys to the genera of old world Culicini: adults and fourth stage larvae. The tribe Anophelini, comprising two genera, *Bironella* (of no pathogenic interest) and *Anopheles*, which contains about 170 species in all parts of the world, the members of which, though by no means all of them, transmit malaria, occupies pages 117 to 190. Keys are presented of the adults and their fourth stage larvae of the Palearctic, Ethiopian, Oriental and Australian regions with a short key to the African domestic species (including most of the proved malaria vectors). An indication of the breeding places is included in the keys to the fourth stage larvae. Lists are given of important Anopheline synonyms followed by another list giving the important anopheline misidentifications, malaria-carrying anophelines, and anophelines distribution and literature, the distribution being given in tabular form.

Other orders dealt with are Orthoptera, with a key to the four common domestic cockroaches, the Anoplura (lice), Hemiptera (bugs), Hymenoptera (bees, wasps, ants *et cetera*), and Lepidoptera (moths and butterflies), the larvae of some species of which possess urticating hairs or irritating secretions, and the Coleoptera, various species of which have been recorded as coming from man either as larvae or as adults.

The chapter on the Siphonaptera or fleas has been written by Karl Jordan, who gives an interesting introduction followed by a key to the important genera of fleas with notes on the genera mentioned in the key. This is followed by a key to the more important species of Xenopsylla with notes on these species. This is a very important chapter.

The chapter on the Arachnida is by R. J. Whittick and comprises notes on scorpions, spiders, mites and ticks, with a key to the families of ticks, followed by keys to the genera of the Ixodidae and Argasidae with notes on the species of medical importance.

The Pentastomida, Myriapoda and Crustacea are briefly dealt with also by R. J. Whittick. Notes on methods for collecting and preserving insects are given in an appendix.

Important references only are given and are placed at the end, or as footnotes, of the discussion on the subject with which they deal. The book is copiously and excellently illustrated, many of the illustrations being original. This is a book which should be in the hands of all entomologists and hygiene and malarial control officers.

THE SOLUTION OF LIFE'S PROBLEMS.

DR. W. L. CARRINGTON'S excellent booklet is intended to help the ordinary man to solve by means of psychology and religion his own problems of drudgery, fate, fear, sickness, "nerves", sex, and to help his neighbour to solve his also.¹ The author quotes freely from accepted authorities both medical and lay, as well as from the Bible and Book of Common Prayer. The booklet is essentially practical and may be said to be free from hypocrisy and cant. The wording is concise and convincing; there are only forty-eight pages in all. The folly and futility of looking for magic in either the physical or the spiritual plane in the healing of "the ills that flesh is heir to" is stressed. The quotation, "In this world there are no rewards and punishments, only consequences", is used as a thesis to confute those who would blame God or the devil for their misfortunes. The scientific approach to adopt in the summing up of the miraculous is well set forth for the guidance of people untrained in scientific methods. Healing by suggestion and faith healing are dealt with on sound lines, the neuroses are accurately and clearly defined in ordinary language as are the conditioned reflex, emotional reactions and the phobias. The four pillars of character are laid down as direction, devotion, dedication and discipline. There is nothing goody-goody or amateurish about either the author's psychology or his religion. This booklet should be of use to medical practitioners, clergymen, teachers, lawyers and parents.

¹ "A Handbook for the Identification of Insects of Medical Importance", by John Smart, Ph.D., with chapters on Fleas by Dr. Karl Jordan, F.R.S., and on Arachnids by R. J. Whittick, B.Sc.; 1943. London: Printed by order of the Trustees of the British Museum. 8½" x 7¼", pp. 291, with many illustrations, some coloured. Price: 16s.

¹ "The Conquest of Some Problems of Modern Life through Psychology and Religion", by W. L. Carrington; 1943. Second Printing. Melbourne: Surrey Hills and District United Fellowships. 8½" x 5½", pp. 48. Price: 1s. 6d.

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THE NERVOUS FACTOR IN INDIGESTION.

THERE is an old schoolboy "howler" said to have been made by a pupil in the Latin class who translated the words "*pax in bello*" as "freedom from indigestion". While the boy did no more than make a brave guess at the meaning of the words, he might be called an unconscious philosopher. Medical men nowadays hold with full justification that conditions in everyday life that give rise to anxiety, of which war is but one example, are associated with an increase in disturbance of the gastric function. There is no doubt whatever that if the "four freedoms" could suddenly be accomplished, many people would be relieved of the misery of dyspepsia and the general efficiency of the community would be increased. Sir Arthur Hurst expresses views somewhat like these in the opening paper of a special issue of *The Practitioner* for April, 1944, which is devoted entirely to indigestion. He refers to the "care-free days before 1914" and to the "constant anxiety" of the years between two great wars, which led to a steady rise in the incidence of gastric disorders. He then goes on to remark that national and personal security should lead to a corresponding fall in the incidence of inflammation, ulcer and cancer of the stomach. "Freedom from anxiety will also do much to reduce intemperance in alcohol and smoking. Freedom from want will lead to the provision of better food, and widespread education of young women in domestic science should lead to better cooking. Improved conditions of labour will prevent bolting of meals. Together with the provision of adequate holidays it will also prevent their consumption when digestion is inadequate as a result of fatigue." While this as a bald statement may appear a little too optimistic for unqualified acceptance, it shows the present-day trend of informed opinion. Sir Henry Tidy in the same journal makes some interesting observations on the incidence of peptic ulcer. He refers to the spectacular arrival of duodenal ulcer, the diagnosis of which was based almost solely on the observation of

melenas associated with some form of upper abdominal pain. It was, Tidy points out, often thought that Moynihan, who battled for earlier and more general recognition of duodenal ulcer, had distinguished an entity previously overlooked. This is not quite correct, for Moynihan's campaign "coincided with the rise of duodenal ulcer from a rare to an everyday occurrence". It should be stated, especially in view of the "*pax in bello*" reference, that several observers have failed to find among members of the armed forces an increase in the incidence of peptic ulcer; it is stated, however, that the war has revealed the unexpected commonness of peptic ulcer and gastritis in the civilian population before the war began. The present intention is not to deal exclusively with such definite entities as ulcer and gastritis, but to include dyspepsia of lesser moment. And in this connexion it may be remarked that C. A. Hinds-Howell writes in the *British Medical Journal* of June 6, 1942, that he found among army personnel an increase in the incidence of neurotic dyspepsia for the year 1941 as compared with 1940. Army personnel form a specialized group of selected individuals in certain age groups and need not in the present connexion be separately considered. It is reasonable to conclude that since September, 1939, the factors likely to give rise to increase in anxiety in many members of the civilian population have not become less.

In our consideration of the nervous factors of indigestion it is not sufficient for us to note the fact that emotion which produces anxiety can have a bad effect on the digestive apparatus and to let it go at that. We must try to determine exactly how the change is brought about. In a paper on the psychological aspects of indigestion in the issue of *The Practitioner* already mentioned, Aubrey Lewis points out that since it is possible to demonstrate in many persons with peptic ulcer that they have felt long-standing anxiety, resentment, guilt or frustration, and since hyperchlorhydria is by general consent the common and possibly essential physiological feature of peptic ulcer, it has been concluded that baneful emotions contribute to the changes in function that cause dyspepsia and perhaps lead to tissue changes in patients with ulcer. Lewis sees weaknesses in this argument. Some observers have noted that in man and other animals fear and rage may be accompanied by reduced peristalsis and output of hydrochloric acid. He suggests that, like Pavlov's dogs, people can be divided into types—in the aggressive type salivary and gastric secretion rises during and after stress, and in the other, comprising the timid and inactive, it falls; those who manifest a proneness for the secretion to rise are those prone to develop dyspepsia and ulcer. If these two types exist, they may clearly exist in many grades and there will be many persons whom it will be difficult to place in one group or the other. Lewis then goes on to discuss two further questions. One is the existence of an ulcer constitution. He presents the view commonly held that patients with ulcer are rarely casual and lethargic, but that they are often highly strung determined people, conscientious, ambitious and active, driving themselves in an effort to attain a perhaps unattainable standard. He discusses the limitations of this view and concludes, with commendable wisdom, that the bulk of observations go no further than to indicate that on retrospective inquiry a considerable number of patients with peptic ulcer report that they have been of a worrying, driving disposition, emotionally responsive and seldom content to be still.

The other aspect discussed is the mechanism by which the emotional peculiarities may be linked with the gastric changes in the patients under consideration. Lewis points out that the linkage is usually assumed to be autonomic and that some observers insist that vagotonia is a frequent and characteristic finding in peptic ulcer. He thinks that it is probably unsafe to go further than to assume that these patients have a labile autonomic nervous system. He refers in some detail to some observations by S. Wolf and H. G. Wolff on a man of fifty-six years of age who had had a gastric fistula since he was nine years old. These observations were recorded in *The Journal of the American Medical Association* of October 31, 1942, and were discussed in these columns in the issue of February 20, 1943. Again Lewis is cautious. He is prepared to concede the importance of emotional disturbance in contributing to or in aggravating ulcer; but as there are other factors to be considered, he will not allow the assumption that the emotional disturbance has been wholly or mainly responsible. Turing to dyspepsia of a lower order, in which ulcer is not present, we see that much the same consideration will apply. The so-called functional dyspepsias are very common and, to quote Lewis once more, if the disturbance of function is of the same kind as the disturbances observed in angry or frightened people, and if anger and fear appear to be unduly present in persons suffering from functional dyspepsias, it is reasonable to assume that the common cause helps to produce the common effect. That these requirements are not fully satisfied is not so important as the fact that there are many patients in whom the conditions are satisfied.

From the views that have been stated it is clear that generalizations cannot be made. Sufficient is known, however, to justify, or better still, to make imperative, a search for an emotional factor or even for an emotional basis in every case of "indigestion". As has been stated so many times, emotion cannot be measured. This is equally true of an emotional stimulus. To become a stimulus, an event, a thought or a suggestion must have a subject on which it can act, and the subject must be susceptible to stimulation. The effect produced on the individual will depend on his temperament, and even then on his mood at the moment of impact. The discovery of the emotional factor or basis will depend on the assiduity and the experience of the clinician, and the importance of accurate diagnosis cannot be over-emphasized. Calamity lies in wait for the unwary when he is dealing with one of the lesser forms of dyspepsia no less than when he is faced with a patient who may have a lesion like an ulcer as well as a severe emotional disturbance. In the matter of treatment recognition of an emotional factor in the aetiology is of equal moment. On the skilful psychiatric treatment of the patient, his future welfare will depend, even if all the other factors that go to make up the syndrome that he presents are recognized and as far as possible eliminated. Sometimes the difficulty of treatment is complicated by the fact that the patient's emotional disturbance seems to be inseparable from the conditions of the present world-age. Though it is possible that in these circumstances the patient may be so sorely beset that in the words of another author "the Atlantic Charter will not cure the malady", these cases must be very few and far between. On the whole we may conclude that our schoolboy with his "howler" can be vindicated.

Current Comment.

DUST SUSCEPTIBILITY AND LOBAR PNEUMONIA.

THE view is prevalent that the inhalation of dust-laden air predisposes to pneumonia. On superficial examination such a view appears sound; for it seems reasonable to assume that dust will lower the resistance of the respiratory tissues. But more careful examination of the argument might create a doubt in the mind of the investigator. Anna M. Baetjer and Frederick J. Vintinner have recently recorded the results of experimental work on the influence of silica dust and feldspar dust on the susceptibility of rats to lobar pneumonia.¹ Before describing their experiments they briefly review some of the literature. They point out that high mortality rates and high morbidity rates have been reported as occurring in men engaged in dusty occupations. For example, the incidence of pneumonia in the mid-western districts of the United States of America increased after the dust storms of 1935. Schnurer, after a study of several hundred lungs, reported that "pneumonia case and death rates increased in direct proportion to the degree of pneumoconiosis". On the other hand, Pierpont declared that in the iron mining communities of Michigan and Wisconsin, the death rate from pneumonia was lower than in these States as a whole, and that "the men with silicosis did about as well as those with no silicosis and men with advanced silicosis recovered from pneumonia without any specific treatment". Cohen and Charr pointed out that lobar pneumonia in anthracite miners affected chiefly the parts of the lung that were not involved in the anthracosis-silicotic process. Brundage found that the frequency of disability due to pneumonia was much lower in anthracite miners than in workers in other industries. Investigations by Kibby showed that the death rate from pneumonia was lower in coal miners than in surface workers. Gardner states that the prevalent opinion in the United States of America is that "lobar pneumonia is a rare complication of silicosis, but that bronchopneumonia is common".

Dürck found that bronchopneumonic foci appeared in animals into whose tracheæ he had introduced various dusts, together with staphylococci, streptococci and diplococci, whereas animals inoculated with the organisms alone were unaffected; however, certain dusts without organisms produced similar effects. Campbell found that mice exposed to a dusty atmosphere for long periods were more susceptible to pneumonia and bronchopneumonia than mice not so exposed. Varwald found that silicotic rabbits were not specially susceptible to the pneumococcus; he noted that silicotic nodules seemed very resistant to organisms.

Baetjer and Vintinner remark on the contradictory evidence provided by these various studies. They point out that much of the illness encountered in industry is respiratory, and they stress the importance of determining whether the various environmental conditions in industry can be regarded as predisposing causes. "In industrial studies it is difficult to evaluate the role of any one factor such as dust, since many other environmental and social factors are simultaneously affecting the workers." For this reason they designed experiments to investigate the susceptibility of laboratory animals to pneumococci in a dusty atmosphere. Rats were placed in wooden chambers into which silica dust or feldspar dust was blown. The duration of exposure varied from one day of eight hours to 157 days. In some cases exposure was continued after inoculation with pneumococci, and in a few cases exposure was not commenced until after inoculation. No attempt was made to ensure a uniform concentration of dust. Actually the concentration varied from one hundred million to nine thousand million particles per cubic foot. The size of 95% of the particles was less than 5.0 μ . Control rats were kept in similar chambers with a similar air supply, without added dust. Inoculation with type I pneumococcus was made into the left main bronchus through a small curved antrum needle. The organisms were suspended in a solution of gastric mucin; for

¹The *Journal of Industrial Hygiene and Toxicology*, April, 1944.

previous experiments had shown that lobar pneumonia similar to that seen in man could be produced by very few organisms when administered to animals in this way. In a number of experiments the organisms were given suspended in broth; but this method was not considered to reproduce the conditions leading to lobar pneumonia in man; for much larger doses were required to infect the animals, and septicæmia rather than pneumonia occurred as the typical reaction. As a control of the technique of inoculation, some rats were given mucin solution alone and some sterile broth alone.

When the organisms were given in mucin the mortality rate from pneumonia in the animals that had been exposed to dust was lower than that in the control animals, and the difference in the mortality rates of the two groups was greater, the longer the exposure to dust. The rate of infection and the case mortality rate were also lower in the animals exposed to dust. When the organisms were given in broth, there was no significant difference between the mortality rates in the two groups of animals; but in those exposed to dust the incidence of gross pneumonic consolidation was lower than in the controls.

Baetjer and Vintinner conclude that the inhalation of silica dust or of feldspar dust by rats has a protective effect against pneumococcal pneumonia. They suggest two possible reasons. First, the resistance of the pulmonary tissues might be enhanced by the presence of macrophages that have appeared in response to invasion by dust particles. Secondly, mucin seems to protect the organisms so that they are able to multiply rapidly and produce a local lesion; it may be that the dust particles adsorb the mucin and so render the organisms more vulnerable. It is also possible that the particles may retard the local activity of the bacteria by adsorbing them as well as the mucin. "This protective mechanism would explain the beneficial effects of the exposures following inoculation."

The results of these experiments are likely to surprise most people who have taken only a superficial interest in the subject. At the same time too great reliance must not be placed on the results of animal experiment; they must be weighed with clinical observations.

"ALLERGIC" AGRANULOCYTOSIS.

MALIGNANT neutropenia or agranulocytosis used to be an uncommon condition, at least in most parts of the world, even when allowance is made for its occasional non-recognition. The energetic warnings of Plum of Denmark and other workers directed our attention to the importance of drugs in its aetiology, and in Denmark it was observed before the war that the banning of amidopyrine at once reduced the incidence of this dangerous failure of bone-marrow function. The nature of the idiosyncrasy which makes certain unfortunates more sensitive than other persons to the toxic effect of certain drugs on the manufacture and output of neutrophile leucocytes is obscure. J. A. Blue has published a case in which he ascribes this hypothetical constitutional factor to allergy.¹ The cynic may observe that especially since the last war the word "Mesopotamia" has ceased to be blessed, and has been supplanted by "allergy". But, though social rivals or enemies may perfectly understand what they mean when they claim to be allergic to each other, in medical science we are not quite so fortunate. Blue's case was that of an eighteen year old youth, who suffered from lobar pneumonia complicated by *otitis media*, suppurating cervical adenitis and pyelonephritis. After the administration of 27 grammes of sulphadiazine he appeared to be convalescing, but a recrudescence of the lung lesion took place, with great swelling of the lymph nodes in the neck, and administration of the drug was resumed. After four grammes had been given the intensity of soreness and ulceration in the throat suggested the presence of granulopenia, and indeed, of 1,950 leucocytes to the cubic millimetre of blood, 97% were lymphocytes and 3% monocytes. After vigorous treatment with blood transfusions and "Pentnucleotide" he recovered, after the painful, though possibly not discouraging, episodes of *otitis*

media and suppurative adenitis of the neck. Blue considers that a family history of allergy in this case is relevant. This is a vague and rather unsupported idea. Perhaps a statistical survey might be worth making, with adequate controls; but the impression that most users of sulphonamides have is that, while dangerous granulopenia may follow over-high and over-prolonged dosage, it may appear fairly early and without warning. Reference has been made in these pages recently to an optimistic pressing of a sulphonamide drug after granulopenia had occurred, apparently without dire results. Nevertheless it must be realized that the drugs of the sulphonamide series are potentially poisonous to the bone marrow, and the depression of granulocytic functions ranges from the slight to the exceedingly dangerous. Admittedly the actual danger is small if due care is taken; but whether we take the view that the predisposing factors are embraced in that vague term "allergy", or whether we simply say that we do not know what they are, our responsibility remains the same. Sulphonamides may even be given with safety in some cases in which the leucocyte count is already low or has fallen during illness and treatment; but judgement, skill and caution are needed. An English teacher of medicine said some time ago that the toxic effect of a drug could not be justly estimated till it had been used for ten years. He was probably correct, and we must remember that the prodigious activities likely to take place in the synthesis of newer and possibly more powerful remedies will continue to demand accurate knowledge of the properties and effects of the weapons we employ.

ARTIFICIAL RESPIRATION.

THERE may not seem anything very new in the physical methods of resuscitation used to restore respiratory function in sufferers from immersion or sudden diaphragmatic paralysis. There is in fact nothing very new to offer; but it is good to see evidence of a growing interest in Eve's method. The introducer of this simple and very effective manœuvre has just published an account of it in the American medical Press, which will, we hope, secure greater recognition of its value.¹

Since Silvester's method was replaced by the more efficient Schafer's method, no further advance was made till Eve pointed out that by rocking the patient's body up and down on an axis at right angles to the centre of his body adequate ventilation could be secured. Of course, in addition there are all the mechanical devices, such as the so-called "iron lungs", which supply alternating negative and positive air pressure in an air-tight cabinet enclosing the patient. Rather simpler is the Bragg-Paul respirator, in which alternating pressures are applied through a large cuff round the thorax. Such complex forms of apparatus are not always to hand, and they need even more skill and judgement in their use than the simpler methods, though they are invaluable in cases of prolonged respiratory failure if properly used. Eve's method requires a certain amount of apparatus; but a stretcher with securing straps that can be rocked up and down over a central fulcrum will suffice, or even a much simpler extemporization. Eve first applied his method by using a rocking chair. It is certainly necessary to have a method which needs only the bare hands, but emergency organizations would do well to supply some means of applying Eve's method. Its advantages are its efficiency, its harmlessness, and its conservation of the energy of the helpers. It has been shown that one double "rock"—that is, head up and head down at an angle of 50°—is enough to secure 600 cubic centimetres of ventilation. Even 30° of rocking will produce enough ventilation, and a rate of ten double "rocks" per minute need not be exceeded. The patient's chest and abdomen are also immune from damage by earnest and muscular first-aiders.

No doubt the Eve method is widely known. Recent descriptions of simple rocking stretchers of folding type have been published, and these, together with the article referred to here, can be commended to those interested.

¹ The American Journal of the Medical Sciences, April, 1944.

¹ The Journal of the American Medical Association, April 1, 1944.

Abstracts from Medical Literature.

OPHTHALMOLOGY.

First Aid in Industrial Eye Injuries.

R. M. DICKSON (*The British Journal of Ophthalmology*, December, 1943) reports the results of first-aid treatment of 2,478 eye injuries in thirty collieries in Scotland extending over a period of eighteen months, and of 11,953 eye injuries in thirty factories in Scotland in six months. The treatment adopted was essentially the use of a 10% solution of "Albucid Soluble" (sodium sulphacetamide) as eye drops. Of the injured personnel, 96% returned to work without loss of time. In factories and shipyards there was no loss of working time in 98.87% of cases. The author points out that these eye drops have already been recommended by the Ministry of Fuel and Power for use as first-aid treatment in collieries throughout the country. He believes that the excellent results obtained after six months' trial in factories fully justify the recommendation that the drops should be adopted in all forms of industry where there is any danger of injury to the eyes.

Eye Changes due to Methyl Alcohol Poisoning.

I. S. MCGRAWOR (*The British Journal of Ophthalmology*, December, 1943) has made a histological examination of the eyes of four persons who had died from poisoning through imbibition of methanol or methyl alcohol. The use of the substance as an adjuvant or fortification of other drinks is frequent on the Continent and was common in the days of prohibition in the United States of America. The retinæ of the eyes of the four subjects were examined by the routine method of staining with hemalum and eosin and by the method of examination in bulk, in which staining with scarlet red is first carried out, and then the bulk preparation is embedded in gelatin and sectioned. No changes were found in the retinal ganglion cells which could with certainty be attributed to acute methyl alcohol poisoning, whether in the lipid changes in the ganglion cells, in the size and shape of the ganglion cells, or in the nuclear content. Serial sections of the optic nerve were made in each case and stained with hematoxylin and eosin, and by Marchi's method, and with a rapid stain for myelin; no abnormality was found. The subjects whose eyes were examined had died within a few hours after imbibing the poison, and histological evidences were few. The author states that those evidences in acute poisoning are not sufficient to show whether the retinal tissue or the nerve tissue is primarily affected. The four subjects were among eighteen who were poisoned, eleven recovering. Four of those who recovered were examined after one year; they had been blind in the acute stage. One had no defect in vision, the second had bilateral relative scotoma, the third had absolute scotoma in one eye, while his other eye was normal, and the last had relative scotoma with good vision in the affected eye, the other eye being

normal. The author considers that a review of the literature and follow-up examination of these patients suggest that the poison acts on the centre of the optic nerve.

Experimental Corneal Ulcers.

J. M. ROBSON (*The British Journal of Ophthalmology*, January, 1944) presents the results of an experimental investigation of corneal ulcers produced by various types of organisms in the eyes of rabbits. In the case of *Bacillus pyocyaneus*, when a 30% solution of sodium sulphacetamide ("Albucid Soluble") was applied within one hour of inoculation of the infecting agent, ulceration was completely prevented in more than half the treated eyes; but when treatment was delayed for twelve hours its value was greatly reduced, although it still had some effect. In the treatment of pneumococcal infections the local effect of a number of substances was investigated; these were applied in solution at intervals of one hour, in order that a high concentration should be maintained in the cornea. The best results were obtained with penicillin, though quite striking effects were also observed to follow the use of sodium sulphacetamide. When penicillin treatment was begun one hour after inoculation, ulceration was completely prevented in seven out of eight eyes, and only a small ulcer developed in the eighth. When the treatment was delayed for longer periods the effect was much reduced, but some benefit was still obtained when treatment was begun twenty-four hours after inoculation. The results with sodium sulphacetamide were not so good. Sodium sulphapyridine was of some value, but it irritates an inflamed eye on repeated application. Proflavine was found to be unsuitable for clinical use. In *Staphylococcus aureus* infections penicillin produced striking results, even in solutions of low potency; sodium sulphacetamide solutions, although less effective, also gave good results. Sulphathiazole sodium formaldehyde sulphonylate proved ineffective. The effectiveness of penicillin and of sodium sulphacetamide was much decreased when treatment was delayed. Hemolytic streptococcal infections were effectively controlled with penicillin when treatment was begun one hour after inoculation; delayed treatment was of only slight benefit. Sodium sulphacetamide and sulphanilamide produced good results only when treatment was begun immediately after inoculation of the infective agent. Investigation of tuberculous lesions caused by both the bovine and the human strain of the tubercle bacillus is still in progress.

Visible Emboli in Retinal Arteries.

W. E. C. DICKSON, G. C. PRITCHARD, L. H. SAVIN AND A. SORSBY (*The British Journal of Ophthalmology*, January, 1944) report two cases of visible emboli in retinal arteries, and present a review of the literature. The emboli were in branches of the central artery, and spasm was superadded. One of the patients died from subacute infective endocarditis twenty-one days after the onset of the ocular symptoms, which themselves occurred six days before the full development of the symptoms of his illness. Histological examination of the affected eye revealed an embolus in the process of canaliza-

tion. In the other case, no causative abnormality could with certainty be discovered; the patient's chief complaint was of tiredness due to overwork. Approximately seven months after the occurrence of the embolus in this case the disk was atrophic in the inferolateral quadrant, and white lines were apparent along the walls of the inferior temporal branch of the central artery. The authors state that on clinical grounds the occurrence of embolism as distinct from spasm, thrombosis and endarteritis of the retinal arteries can hardly be doubted, and that the present study supplies clear histological evidence of this.

Silver Nitrate and Foreign Bodies in the Cornea.

D. F. GILLETTE (*Archives of Ophthalmology*, February, 1944) has found silver nitrate of value in the removal of foreign bodies from the superficial epithelium of the cornea. He has been chiefly concerned with foreign bodies having an iron content, since these produce a rust stain. He describes the method employed, and comes to the following conclusions: (i) The use of silver nitrate facilitates the removal of the foreign body, burn and stain from the corneal epithelium. (ii) It causes a minimum amount of trauma. (iii) It is economical, since it conserves time and function. The author points out that the earlier the patient is treated, the more successful is the method.

Solar Keratoconjunctivitis Associated with Amblyopia.

P. T. MCPALPINE (*American Journal of Ophthalmology*, March, 1944) reports two cases in which exposure of the eyes to ultra-violet rays produced amblyopia and keratoconjunctivitis. The patients were two brothers who purchased a small carbon arc lamp, with which they gave themselves three fifteen-minute periods of irradiation within forty-eight hours. Twelve hours later ocular symptoms required their admission to hospital. Visual acuity was reduced to the perception of hand movements, and the visual fields contracted to a temporal crescent in each eye. Gradual recovery occurred over a period of eleven days. The author believes that consideration of the effects of ultra-violet irradiation makes it probable that the contraction of the visual fields and the temporary amblyopia in these patients were caused by the thermal effect of the carbon arc lamp.

The Penetration of Penicillin into the Eye.

K. MEYER AND J. DI GRANDI (*Archives of Ophthalmology*, January, 1944) have studied the penetration of penicillin into the anterior chamber of the eyes of rabbits. The sodium salt of penicillin was applied locally in various ways, and the antibacterial activity of the aqueous *in vitro* served as the basis for determination of the amount of penicillin in the anterior chamber. It was found that the ionization method of introduction of penicillin into the aqueous increased the concentration to ten times that obtained by the corneal bath method without a wetting agent, and to about eight times that produced by the corneal bath method with the addition of a wetting agent ("Aerosol

1B"). After a single iontophoretic application of a solution of the sodium salt of penicillin, the aqueous exhibited antibacterial activity for almost four hours; after a single corneal bath with a solution of the same concentration, the antibacterial activity of the aqueous was exhausted in a little more than two hours. The repeated application of solutions and ointments containing penicillin failed to produce any antibacterial activity in the aqueous. The addition of wetting agents had no effect. It was found that small amounts of penicillin entered the aqueous from the blood stream. Secondary aqueous contained several times as much penicillin as primary aqueous.

"Pentothal Sodium" in Ophthalmic Surgery.

H. F. FALLS (*Archives of Ophthalmology*, February, 1944) urges caution in the use of "Pentothal Sodium" as an anæsthetic agent in ophthalmic surgery. "Pentothal Sodium" is a barbiturate, and is therefore endowed with considerable variability of action. One of the chief effects of intravenous administration of the drug is depression of the respiratory centre in the medulla. The lack of signs of impending respiratory failure makes the margin of safety too narrow to permit unqualified use of this drug. Many of the post-operative sequelæ of the administration of "Pentothal Sodium" are extremely serious; restlessness, nausea and vomiting are dangerous when they follow an intraocular operation. The frequent long periods of reaction that follow the administration of large amounts of the drug require the careful supervision of both the physician and the nurse, so that resuscitation may be instituted at once when necessary. The author reports one death and seven cases of severe apnoea that followed "Pentothal Sodium" anaesthesia; he admits that errors of technique were the cause, but emphasizes that these occurrences illustrate the dangers that may be incurred.

OTO-RHINO-LARYNGOLOGY.

Application of the Hemilaryngectomy Technique in Laryngectomy.

MERVIN C. MYERSON (*Archives of Otolaryngology*, February, 1943) holds that the advantages of resection of the larynx in two halves, following the technique of laryngo-fissure and hemilaryngectomy, are greater simplicity, less trauma and less local reaction, and the conservation of a greater amount of healthy mucous membrane for purposes of repair. Access is obtained through a vertical mid-line incision. The perichondrium is elevated from the outer aspect of the thyroid ala on each side, and the larynx is opened by splitting of the thyroid cartilage in the mid-line. After separation of the striped muscles, the soft tissues are divided along the borders of the ala, which is then held forward by a retractor hooked into the posterior border. Dissection of the inferior border is carried through the crico-arytenoid joint. The arytenoid may be removed with the block, or if it is desired to preserve its overlying mucosa, the cartilage may be separately

removed submucously. The cricoid may be removed after the thyroid hemilaryngectomy if that region is found to be involved in the growth. Similarly the epiglottis is removed or allowed to remain as appears necessary. The pharyngeal defect is closed by two superimposed inversion sutures and the fascia and muscles are next drawn over the stump. The skin is closed, a drain being left in the lower end of the wound. Tracheotomy may with advantage be performed a week or more before the major operation. The subsequent respiratory stoma is made by fixation of the cricoid or upper tracheal opening to the skin opening.

Adenoma of the Bronchus.

HERMAN HENNEL (*Journal of the Mount Sinai Hospital*, September-October, 1943) discusses a case and considers the difficulty of making an exact diagnosis of the origin and extent of bronchial adenoma, and of deciding the type of operation necessary for cure, when the tumour is not directly visible. An otherwise robust youth experienced numerous acute febrile episodes associated with a cough. X-ray examination revealed a shadow in the right paratracheal region. Recovery from each attack was always uneventful, and in the intervals the patient was well for a year or more. Hemoptysis during one of the attacks, and then the presence of more severe symptoms than previously, led to admission of the patient to hospital, and to more extensive examination and study of the case. Clinical signs and X-ray investigation indicated atelectasis of the right lung. Laboratory examinations excluded tuberculosis, and adenoma was suspected. It was found at bronchoscopy that a tumour, subsequently shown to be an adenoma, projected into the right main bronchus at the level of the upper lobe bronchus. Hemorrhage from the tumour apparently completed occlusion of the main bronchus and atelectasis followed, for the lung reexpanded after bronchoscopic aspiration. The upper lobe bronchus was occluded so that it could not be looked into. The main bronchus was either pressed upon or softened so that it tended to collapse. Bronchoscopic removal appeared to be impossible. It was difficult to be sure whether the paratracheal X-ray shadow represented a large tumour or an atelectatic upper lobe. Angiography and bronchography failed to clarify the picture. The author states that the problem which remains is whether cure can be effected by lobectomy or whether pneumonectomy will be necessary. A tumour confined within a branch of the right upper lobe bronchus should be successfully dealt with by the former operation. If the tumour is of penetrating type, then the more radical pneumonectomy will be required. Removal by some means is essential, otherwise pulmonary infection is likely to prove fatal. The author believes that total removal of the lung will be necessary.

"Prostigmin" Therapy of Atrophic Rhinitis.

R. HENNER AND W. BUSBY (*Archives of Otolaryngology*, November, 1943) believe that the atrophy of atrophic rhinitis is due to decreased blood supply secondary to local arterial disease. They hold that the effect of

estrogens is due to hyperæmia rather than to any direct hormonal effects upon the tissues. They felt that "Prostigmin", a parasympathetic stimulant with more prolonged effects, might give better results. Recordings of nasal temperature were used to determine the effect of the applications and to demonstrate that the more rigorous care associated with such treatments was not the sole explanation of improved results. Small rises in the weekly average temperature of the nasal mucosa were demonstrated in the patients treated. In addition to routine cleansing treatments, such as the use of saline irrigations, "Prostigmin Methylsulphate" (1:2,000) was employed as a spray, 0.25 cubic centimetre being used on each side, four times a day. Eight cases were studied; crusting was diminished and the unpleasant odour disappeared within one to four weeks. Some of the patients reported that at times they felt as if they had a cold, and occasionally frontal headaches occurred. There were no other unpleasant effects.

The Local Treatment of Acute Rhinitis with Sulphathiazole.

EVAN EBERT (*Archives of Otolaryngology*, October, 1943) found no discomfort and no ill effects after insufflation of sulphathiazole powder into his own nose. In Göteborg, Sweden, ninety-two patients suffering from acute rhinitis were treated by daily insufflations of the powder for three or four days. In no case did any of the complications of a cold develop and most patients were cured in a shorter time than is usual with this disease. The feeling of irritation, sneezing and fullness in the nose are nearly always instantly relieved. By weighing the loaded insufflator before and after use it was calculated that the average weight of powder used in each insufflation was 0.0164 gramme, and the amount administered to each patient during the course of treatment averaged 0.12 gramme. None of the patients suffered any toxic reaction, nor were any deleterious effects observed in the nose.

Secretory Otitis Media.

I. HANTMAN (*Archives of Otolaryngology*, December, 1943) states that in only a small proportion of a series of 76 cases of the serous or catarrhal form of secretory otitis media was he able to give relief merely by attention to naso-pharyngeal hygiene and inflation through the Eustachian tubes. In 59 cases of the series speedy relief of symptoms and uniformly good results were secured after myringotomy. Only a small puncture was made, and in most cases this was well tolerated without anaesthesia. Inflation was performed immediately after the puncture had been made, and this was usually repeated several times within the next three to seven days. Recovery was complete in seven to ten days. The author remarks upon the tendency to recurrence of exudative otitis media in certain subjects. In some cases puncture was resorted to more than once, without untoward results. This type of inflammation rarely advances to suppuration. In only three of the series of 99 ears so involved did purulent inflammation develop.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on May 25, 1944, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney. Dr. G. C. WILLCOCKS, the President, in the chair.

Influenza.

Dr. F. M. BURNET, Director of the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne, read a paper entitled "Influenza and Other Respiratory Infections" (see page 1).

Dr. G. C. Willcocks, from the chair, thanked Dr. Burnet for coming from Melbourne and giving those present expert information on a very important matter. Dr. Willcocks wondered whether it was now thought that the influenza pandemic of 1918-1919 was one of the virus A or virus B infections. To those who had not experienced it, it was an incredible event. Dr. Willcocks recalled the fact that on the *Olympic* crossing from America to England 100 of the troops on board had died. Many ships became derelicts at sea, because everyone on board was ill. Dr. Willcocks then welcomed the members of the United States Army Medical Corps who were present; he felt sure that they had enjoyed hearing a discussion of so important a subject by a master. As no one wished to discuss Dr. Burnet's address, Dr. Willcocks then called upon Professor H. K. Ward to propose a vote of thanks.

PROFESSOR H. K. WARD said that such a mass of authentic information on the subject of influenza had been acquired in the last few years that it was difficult to believe that it was only eleven years since Laidlaw and his colleagues had made their great discovery. To that information Dr. Burnet had made some notable contributions, and that fact was recognized when in 1943 Harvard University invited him to give the Dunham Lectures with influenza as his subject. Dr. Burnet was the latest of a long line of distinguished scientists to give the lectures. Scientists in Australia acquired some reflected glory from that invitation. Professor Ward thought that there was some evidence that some diminution had occurred in the incidence and virulence of the true bacterial infections. It was necessary only to think of diphtheria, streptococcal diseases, tuberculosis; and lately Dr. Francis in America had called attention to the decrease in the incidence of pneumococcal pneumonia, at the same time drawing attention to the possible increase in the incidence of primary atypical pneumonia. Professor Ward wondered whether there was a real increase in the incidence of the last-mentioned disease, or whether medical practitioners had simply become more used to recognizing it as a clinical entity. Professor Ward thought that amongst the virus diseases, the respiratory virus diseases, or what were thought to be the respiratory virus diseases, were the most common in temperate and cold climates. That fact presented a challenge to men like Dr. Burnet and his colleagues. The world still had hanging over it the shadow of the 1918 pandemic and all those respiratory diseases whose aetiology was as yet unknown. Those scientists who were working on those particular problems looked to Dr. Burnet and his colleagues to make new progress, and Professor Ward thought they would not be disappointed, though they all realized the tremendous technical difficulties that were involved. Australia had sustained a great loss in the departure of Dr. C. H. Kellaway for England; Dr. Kellaway had built up the Walter and Eliza Hall Institute of Research in Pathology and Medicine in Melbourne. The institute was of great value in Australia and had made great contributions to medicine in general. It was fortunate that Dr. Burnet was available; he would be a worthy successor to Dr. Kellaway. No one who had heard his address had any feeling that the Walter and Eliza Hall Institute would not carry on those traditions in the future. In conclusion, Professor Ward said that he had great pleasure in proposing a vote of thanks to Dr. Burnet.

COLONEL JAMES BORDLEY, of the United States Army Medical Corps, seconded the vote of thanks at the invitation of the President. Colonel Bordley said that he could not speak as an authority on virus diseases, but for some time he had been much interested in Dr. Burnet's work, and he had enjoyed listening to his address. Some of the American members of the audience had been in Australia for two years, and Dr. Burnet's talk had brought back to them the

names and work of some of their American colleagues, work that was just "under way" when they left. Colonel Bordley said that the same question had arisen in his mind as in Dr. Willcocks's—what did Dr. Burnet now think about the relation of the influenza viruses A and B to the pandemic of 1918-1919? Naturally they all feared that such a thing might creep up on them again. They were in a much better position at present, because they could handle the secondary complications better; but they might be faced with something about which they knew all too little, although their knowledge of virus infections in general had certainly advanced a great deal. Colonel Bordley wished that Dr. Burnet and his colleagues could help with the provision of a more rapid method of telling with just what infection medical practitioners were dealing; at the present time there was a long time to wait before they could learn which type of virus infection was present. Colonel Bordley was sure that all those present were much interested in Dr. Burnet's method of immunization; it seemed to offer some hope of protection as far as the viruses were concerned. By way of comment on Professor Ward's remarks concerning the decrease in pneumococcal infections, Colonel Bordley said that he had recently heard from his civilian medical colleagues in one section of the United States that such infections had greatly increased there during the past winter. The strains of pneumococci prevalent were not very susceptible to treatment by the sulphonamide drugs. When the American medical men came to Australia, they were very much on the lookout for atypical pneumonia. They had encountered a number of cases in the United States and they were familiar with the clinical picture presented there. But they had not seen anything like the same number of cases of the condition in the first eighteen months in Australia; they merely came across occasional disorders which they suspected of being atypical pneumonia. They had had one interesting experience in that connexion, and that was the occurrence of a sharp little outbreak of atypical pneumonia which took place in the months of November and December. Some of the patients were very ill; but the epidemic spread only within close confines, and died out quickly. Colonel Bordley said that material from two of the patients had been sent to the Walter and Eliza Hall Institute to see whether viruses were concerned in the aetiology; but the result had been negative. In conclusion, Colonel Bordley seconded the vote of thanks to Dr. Burnet.

Dr. Burnet, in reply thanked Professor Ward and Colonel Bordley for their remarks. With regard to the nature of the pandemic of 1918-1919, he said that one of the things he had particularly noted in American laboratories was the large number of ice boxes in which were stored indefinitely pairs of serum from various types of infection; if only similar pairs of serum from the 1918 pandemic were available, it would be possible to learn much more about it. Dr. Burnet's opinion was that the pandemic was due to influenza A virus, but that the virus on that occasion was of a much higher grade of virulence than any recent strain. Dr. Burnet felt it a great privilege to have lived through the period during which influenza research was initiated. One of his most prized recollections was of meeting Laidlaw on the steps of his laboratory at Hampstead, and hearing him say: "The ferrets are sneezing." That was the first indication that influenza virus had been successfully isolated and transmitted to an animal. Influenza research had become very interesting from then on, and there was a reasonable hope that some day something would be achieved toward its prevention.

Medical Societies.

THE MEDICAL WOMEN'S SOCIETY OF WESTERN AUSTRALIA.

IN June, 1943, the medical women in Western Australia were sent a notice for a meeting to be held in that month for the purpose of reviving the Medical Women's Society of Western Australia. The meeting was well attended, as sixteen women were present.

The meeting decided that those present should form themselves into a Medical Women's Society of Western Australia, and they asked for group representation with the Western Australian Branch of the British Medical Association, which has since been granted to them. The following office-bearers were elected: *President*, Dr. E. M. Stang; *Treasurer*, Dr. M. Gilchrist; *Secretary*, Dr. D. Champion.

Several meetings have since been held for the purpose of discussing the medical women's attitude in regard to group planning and post-war planning, and also, of course, in relation to the various schemes for the nationalization of medicine.

Hospitals.

THE WOMEN'S HOSPITAL, CROWN STREET, SYDNEY.

We have received the medical and clinical report of the Women's Hospital, Sydney, for the period of twelve months ended June 30, 1943. Indoor patients treated numbered 8,436, of whom 3,198 were infants. Among the outdoor patients, 76 adults and 61 infants were cared for by the district maternity department of the hospital; there were 27,458 attendances at the out-patient department, 875 among infants; and new patients attending the out-patient department numbered 6,505 adults and 378 infants. The number of women delivered was 3,163 in hospital and 61 "on the district"; the number of babies born was 3,198 in hospital and 61 "on the district".

In the section of the report covering the indoor maternity department, it is pointed out that the patients covered are all those over twenty-eight weeks pregnant admitted to the hospital, whether discharged from hospital confined or unconfined, and also all patients admitted to hospital after the delivery of a viable child elsewhere. The patients are divided into two groups, "booked cases" and "emergency cases"; the first group takes in all patients who have attended the antenatal department at least once before admission to hospital, and the second group patients sent to hospital by outside doctors or nurses, or those who had not before their admission to hospital attended the antenatal department. In the first group there were 3,466 patients; of these, 2,894 were delivered in hospital and discharged, 520 were discharged undelivered patients under and over twenty-eight weeks pregnant, 45 were admitted after having been delivered elsewhere, and were discharged from hospital (these patients had previously "booked" in the antenatal department), and seven patients died after delivery. In the second group there were 386 patients; 269 were delivered in hospital and discharged, 65 were discharged, undelivered (these patients were under and over twenty-eight weeks pregnant), 46 were admitted to hospital after delivery outside, and discharged, one died undelivered, four died after delivery in hospital and one died after delivery outside. The mortality rate amongst "booked" patients was thus 2.02 per 1,000 and that amongst "emergency" patients 21.2 per 1,000. It may be noted that during the seven years commencing July 1, 1936, 19,765 "booked" patients have been delivered at the hospital, and 31 have died—a mortality rate of 1.56 per 1,000.

The histories of the seven "booked" patients who died were briefly as follows. The first patient was aged twenty-nine years and was pregnant for the second time; she suffered from albuminuria and hypertension during the last weeks of pregnancy. Labour occurred at the thirty-sixth week and a living premature infant was delivered. Signs of toxæmia persisted. On the ninth day of the puerperium the temperature rose to 103° F. and the patient had a rigor; acute pyelitis was the cause. The patient failed to respond to treatment, and for the next nine weeks she had irregular rises of temperature and pulse rate and severe headache; terminal septicæmia developed and she died. *Staphylococcus aureus* was grown from the blood. The second patient was aged nineteen years and was pregnant for the first time. She was delivered at term after a labour lasting for twelve hours. Moderate hemorrhage during the third stage necessitated the manual removal of the placenta. The patient was suffering from shock and was given intravenously gum and saline solution and later blood. She did not respond, and died two and a half hours after delivery. The third patient was a *primipara*, aged twenty-three years; she was normally delivered of a male infant. The puerperium was normal until the twelfth day, when pyelitis developed and staphylococci were grown from the urine. This condition subsided, and on the twenty-third day a severe attack of measles developed; this led to renal failure, from which the patient died three weeks later. During the terminal stages *Staphylococcus aureus* was grown from the blood. The fourth patient was a *primigravida*, aged eighteen years; labour began with the fetus presenting by the breech. Labour was prolonged, and the breech became impacted in

the second stage. Delivery was difficult; the foetal legs and arms were extended. Moderate post-partum hemorrhage occurred and was followed by secondary shock, from which the patient did not recover. The fifth patient was aged thirty-one years; she was admitted to hospital at term in her fifth pregnancy; the membranes had ruptured four days previously. The following day labour commenced, and during the first stage the patient had a rigor and the foetal heart sounds ceased. Delivery was normal. The next day the patient's temperature was normal, but her pulse rate was rising. On the following day she was gravely ill, but her temperature was still normal. That evening crepitations were present over the lower part of the abdomen, which was slightly distended. Anaerobic streptococci were grown from material from the uterine cervix, from the urine and from the blood. The patient died the following morning. Post-mortem examination revealed an abscess cavity in the wall of the lower uterine segment, extending into the left broad ligament. The sixth patient was a *primipara*, aged twenty years, who was admitted to hospital in the thirty-eighth week of pregnancy with acute pyelitis. A normal delivery took place a few days later. On the following day her temperature was 103° F. and she had a rigor. Culture from the lochia yielded anaerobic streptococci and *Bacillus coli communis*; the blood was sterile. The patient did not respond to chemotherapy, and after some weeks signs of lung abscess developed. Repeated aspiration was unsuccessful, and the patient died on the fifty-third day of the puerperium. The seventh of the "booked" patients who died was a *primipara*, aged seventeen years, who was admitted to hospital in labour with albuminuria; her systolic blood pressure was 160 millimetres of mercury and her diastolic pressure was 120. During labour she had thirteen convulsive seizures and was finally delivered instrumentally of a live infant. She remained comatose but restless for two days, then semi-comatose for three days. Her urinary output was low. Her pulse rate was raised and her temperature was of the "swinging" type. On the sixth day of the puerperium the coma deepened and the patient died.

Six "emergency" patients died; their histories are briefly as follows. The first patient was a *primipara*, aged thirty-nine years; she was admitted to hospital at term, but before the onset of labour. The fetus was in the right occipito-posterior position. Medical induction led to the onset of strong labour. The occiput rotated favourably and the baby was delivered instrumentally. Episiotomy was performed, but the perineum had also been ruptured and considerable pararectal laceration of the vaginal walls had occurred. Many oozing points were controlled with sutures, but the patient's condition deteriorated. Gum and saline solution and blood were given intravenously, but the patient died about five hours after delivery. The second patient was a *primipara*, aged twenty-seven years; she was admitted to hospital shortly after instrumental delivery of a stillborn infant elsewhere. She had had eclamptic convulsions *intra partum*, and at the time of her admission to hospital she was gravely ill with jaundice, hæmaturia and a very rapid pulse rate. *Clostridium welchii* was recovered from the vagina, the blood and the urine, and in spite of treatment death occurred about thirty-six hours later. The third patient was a *primipara*, aged twenty-three years; she was admitted to hospital from an outside private hospital, where she had been in labour for seven days; the membranes had ruptured two days previously. Disproportion at the brim was evident, but the foetal heart sounds were present; a live infant was delivered by Cæsarean section. A low-grade peritonitis developed, from which the patient died twenty-one days later. Pus from the abdominal cavity yielded a growth of *Bacillus coli communis*. The fourth "emergency" patient was aged twenty-six years; she was admitted to hospital at term in her seventh pregnancy. When the foetal head was on the perineum the patient gasped once or twice and died. The baby was immediately delivered and survived. Permission for a post-mortem examination was refused. The fifth patient was a *primigravida*, aged twenty years; she was admitted to hospital in labour, having had three convulsive seizures. During labour she had four more seizures, and she was instrumentally delivered of a stillborn infant. The urine was "solid" with albumin. The patient died twelve hours later. The sixth "emergency" patient was aged thirty years, and was pregnant for the second time. She was admitted to hospital at seven months, having had some hæmorrhage. No placenta was palpated on vaginal examination; slight vaginal hæmorrhage was present. From the tenth day of the patient's stay in hospital toxæmia appeared to be present; but her temperature remained normal until midday on the twelfth day after her admission, when it suddenly rose to 101° F.; at 4 p.m. it rose to 104.6° F., and

she had a rigor. At 7-30 p.m. an examination was made under anaesthesia, blood clot was removed from the vagina and a drainage tube was inserted into the cervix. The patient was moribund, and died at 8-35 p.m. A post-mortem examination revealed an abdominal pregnancy; the fetus, the head of which was in the pouch of Douglas, was of seven months' development; it was stillborn, but not macerated. The placenta was adherent to the bowel and the left wall of the pelvis. The size of the uterus was as if it were sixteen weeks pregnant.

Amongst the complicating factors during pregnancy or at confinement were the following. In 120 cases the fetus was in an occipito-posterior position; none of the mothers died, and eight babies died or were stillborn—a mortality rate of 6.6%. In 88 cases the infant presented by the breech (22 twins were excluded), and in 77 of these no other abnormality was present. None of the mothers died, but eighteen infants were stillborn or died, four being macerated. Eclampsia was present in 26 cases, and three of these patients died; ten of the babies died or were stillborn; the incidence of eclampsia amongst "booked" patients was one in 315. There were 48 cases of accidental ante-partum hemorrhage; thirteen patients were discharged from hospital, undelivered; none of the mothers died, but fifteen babies died or were stillborn. The incidence of ante-partum hemorrhage amongst "booked" patients was one in 114. Placenta praevia complicated 22 cases; none of the mothers died, but nine babies died or were stillborn. The cord prolapsed in fifteen cases (twelve amongst "booked" patients and three amongst "emergency" patients); none of the mothers died, but eight babies died or were stillborn. Albuminuria without eclampsia was present in 217 cases; two mothers died, and 28 babies died or were stillborn. Attempted induction of labour was necessary in 216 cases; one mother died, and 32 babies died or were stillborn. There were 31 twin births; no mother died, but eight babies died or were stillborn. Hydramnios was present in three cases; no mother died, but one baby was stillborn. The perineum was ruptured in 486 cases and post-partum hemorrhage occurred in 136 cases. Forceps were required in 341 cases and manual removal of the placenta was necessary in 66. Antenatal version was attempted in 50 cases; it was successful in 39 and failed in 11. Version during labour was carried out in eight instances; two of the babies lived. There were twenty cases in which cardiac disease complicated pregnancy; no mother died, and one baby was stillborn. Embryotomy and craniotomy were required in three cases; no mother died.

The figures relating to the infants are as follows. The total number born during the year at the hospital was 3,194, 1,655 being males and 1,539 females; there were 31 sets of twins. Of the babies, 91 were stillborn and 101 died during the neonatal period; 52 of the stillbirths and 56 neonatal deaths were among babies born before term. The combined stillbirth and neonatal mortality rate was 60 per 1,000 births.

Information is also given concerning admissions to the isolation block, medical diseases treated at the hospital and surgical procedures and investigations carried out for a variety of disorders.

Correspondence.

MEDICINE AND SOCIOLOGY.

Sir: In your review of medicine and sociology by Dr. E. P. Dark there are some statements that call for criticism.

I am in full accord with Dr. Dark in his belief that health is bound up with the economic structure of society, but not with the political structure. The full measure of good health could possibly be attained under any political system provided the economic structure was based on justice and (this is important) provided human folly could be obliterated. Under no system, whatever its political or economic structure, can the full measure of good health be obtained whilst large numbers of citizens impair their structure by alcohol, gambling *et cetera*. The Stockton-on-Tees experiment, if it proved anything, proved that the private ownership of land was the cause of its comparative failure—the high rent paid for the houses was on account of the high price paid for the land, not the cost of the house.

As regards Laski's thesis, common observation proved that it is wrong, but it would be and is the correct thesis

underlying socialism, for under that system the apotheosis of coercion is attained in the "Dictatorship of the Proletariat"; no change in the plan of a socialist State could be possible through the efforts of any other group, for as is said of Russia, "there are certainly several political parties, but they are all in prison except one". Socialists, among them Dr. Dark, are never tired when denouncing what they call capitalism, to recall that some food material was destroyed in America and other places some years ago, but they all conveniently forget to mention that the peasants in Russia destroyed many thousands of heads of their cattle and vast quantities of grain so that even yet Russia is to some extent depleted of the former. This was done to prevent the forcible collectivization of the farmers. Further, not only was this done, but thousands of the latter were shot and millions torn from their homes and sent to the north "where withering cold and winter pines the clime".

Capitalism, whatever its faults, has nothing like this on its record. Dr. Dark asserts that the position of the right is hopeless and infers we must go right or left. There is no need to go either right or left; to progress we must go straight forward, and this we can do under the present system by suitable and progressive change. What your reviewer calls "the right" has had its case stated by many great men; the greatest of all Russians, Tolstoy, has stated it.

If Dr. Dark or anyone else sincerely desires to have the case for "the right" stated, he can do so by studying (not just reading) the works of Henry George and of Max Hirsch; the latter's monumental work "Democracy versus Socialism" is truthfully unanswerable. But will the socialists study these works? I am afraid, from long experience of socialists and I regret to state it, that the answer is "no".

Socialism is psychologically based upon an emotional attitude. Democracy is based upon reason.

Yours, etc.,

PAUL G. DANE.

111, Collins Street,
Melbourne,
June 16, 1944.

AN UNUSUAL MANNER OF DEATH.

SIR: Perhaps the manner of death of this man is worth recording.

T.M., aged forty-six, commenced life as a mental deficient. He finished as a schizophrenic with advanced secondary dementia. For a short period in between he had been an epileptic. During his childhood, previous to taking his epileptic fits, he had spent three months in bed with rheumatic fever. During his later years he became arterio-sclerotic and occasionally displayed auricular fibrillation. Apart from this he seemed a perfectly healthy, normal individual. He spent his last twenty years in this hospital.

One morning at the age of forty, six years ago, he vomited and collapsed. He developed auricular fibrillation, abdominal distension and rigidity. Under expectant treatment he rapidly recovered, and six days later was vigorously shadow-sparring round the ward—a sport in which he excelled and which he thoroughly enjoyed and assiduously practised.

On the morning of May 24 this year he again suddenly collapsed and was put to bed. He had no vomiting, but his abdomen became rigid and moderately distended. He looked profoundly shocked and the feebleness of his heart action precluded any attempt at surgery. His pain was alleviated with small doses of morphine. He died within twenty-four hours.

On opening the abdomen *post mortem* the transverse colon was moderately distended and a small isolated section of the sigmoid colon markedly so. For the rest the picture was cold upon cold of black bowel suspended in black fluid by a black mesentery.

At first I thought the whole small bowel had been herniated through a defect in the meso-sigmoid. Only when the small bowel had been carefully steered back through this "aperture" did the cause of death become obvious.

The meso-sigmoid was extraordinarily long. The colon could be placed on the table outside the body. The upper and lower portions of the sigmoid were cord-like and the central part ballooned. There had been, until I unravelled it, a volvulus of the sigmoid. The upper and lower ends of the sigmoid loop had been twisted round each other to form a cord, while the ballooned central part formed a knob on the end of the cord. This cord had then swept round the abdominal cavity, picking up the whole small bowel in one loop and ligating both its ends and the whole of its supporting mesentery. The knob on the end of the cord, the

bulbous central portion of the sigmoid, tucked up between the folds of tense small bowel made an effective lock, and as it swelled ensured that the strangle hold round the mesentery pulled ever tighter and tighter. No more than three inches of the lower end of the ileum escaped the ligature and stretched tautly across the lumbar spine to its insertion on the caecum. At the upper end the ligature was placed across the jejunum about four feet below the duodenum. For the rest the small bowel and its mesentery were black. The sigmoid, though distended in its middle third, was not so markedly discoloured.

The patient never vomited, abdominal shock killing him before obstruction produced its terminal picture.

Yours, etc.,

NOEL E. KIRKWOOD, Senior
Medical Officer.

Mental Hospital,
Parramatta,
June 16, 1944.

A TIME-SAVING MASTOIDECTOMY DRESSING.

SIR: I am very grateful to Major J. R. Hutcheon for the description of his results of the management of mastoidectomy wounds by a faithful adoption of Listerian methods with such excellent results (*THE MEDICAL JOURNAL OF AUSTRALIA*, May 27, 1944, page 485).

It is noteworthy that the time saving applies to cavities with rigid walls, filling and healing only a day or two longer than it takes by the same method in acute abscess in soft tissues. Fibroblastic repair is rapid when unimpeded by secondary infection and physical or chemical irritation of packing or antiseptics—interpolations which are not only unnecessary but harmful. Such agencies give a maximum stimulation to the formation of exuberant granulation tissue, which, being pathological, must constantly break down into streaming pus and delay and misdirect epithelial covering by excessive contraction. Really healthy granulation rapidly fills the cavity or the walls readily coalesce if collapsible and the area to be covered is minimal and not depressed. To confirm this I want Major Hutcheon to tell it in his own words. I can foretell his answer; but perhaps he can inform us of some other advantages attending the method he has adopted. I am grateful to think that for many years now I have not had to resort to the exquisitely painful act of packing and unpacking any inflamed bony cavities.

Yours, etc.,

A. C. F. HALFORD, M.D., F.R.A.C.S.

Brisbane,
June 16, 1944.

Obituary.

JOHN HODGSON NATTRASS.

We are indebted to Dr. A. E. Rowden White for the following appreciation of the late Dr. John Hodgson Nattrass.

"Shepherd Boy to Surgeon" is a summary of the picturesque career of John Hodgson Nattrass. Born at Cambrian Hill near Ballarat on March 24, 1870, he worked as a shepherd boy on his father's sheep farm at Horsham until he was twenty years of age. During this time he had only two years of school life, but the influence of the late Dr. Cross in encouraging him to study for a medical career changed his whole life. At the age of twenty he went to Wesley College as a strong lusty youth, and caused a stir in the junior classes by the boys failing to understand that he was a pupil and was not among them as a junior master. His education went ahead by leaps and bounds, and he matriculated in two years' time. Passing on to the University of Melbourne, he graduated M.B., B.S. in 1898, and spent the next three years as resident medical officer at the Melbourne Hospital, the Children's Hospital and the Women's Hospital. He purchased a practice at north Melbourne, and then followed during the next nine and a half years a very busy life. Notwithstanding this, he carried out some valuable research work with Professor W. A. Osborne at the Melbourne University on "Autoplastic Ovarian Transplantation" for which he gained the M.D. degree by thesis. In 1910 he travelled abroad for post-graduate work and studied under Bland Sutton at the London Hospital, Professor Alexis Thompson at Edinburgh,

and stayed and worked with Howard Kelly at Baltimore. The last mentioned became so interested in the research work on autoplastic ovarian transplantation, that he insisted on Nattrass addressing a special clinical meeting of gynaecologists at Baltimore—a meeting which lasted four hours of sustained interest and enthusiasm. Next he stayed and worked with Kocher of Berne, Tuffier of Paris and Wertheim of Vienna. On his return to Melbourne in 1911 he practised as a gynaecologist in Spring and Collins Streets. He was then appointed an out-patient surgeon to the Women's Hospital and later became senior indoor surgeon until his retirement in 1926, after seventeen years' service.

John Hodgson Nattrass had many other interests. In 1907 he was President of the Melbourne Medical Association, Worshipful Master of the University Lodge, Number 177, in 1914. His military appointments were notable. He entered the University Officers' Corps of Instruction in 1897, and the Army Medical Corps as captain, major and lieutenant-colonel. He was rejected for service abroad in 1914 because of a physical infirmity of the right leg. He became senior medical officer at Queenscliff Forts, and later senior medical officer at Broadmeadows Camp, acting officer commanding Number 5 Australian General Hospital and principal medical officer, Camp Headquarters' Staff, and finally assistant principal medical officer, Third Military District (Victoria). He was mentioned in orders for "especially meritorious service to Australia during the war".

In 1916 he formed a syndicate which built Lister House, Collins Street, and was chairman of directors from its inception to his death.

In 1927 he retired from practice and again visited England and the Continent.

He married Miss Annie Burton, second daughter of the Reverend John Burton. John, the only child, graduated in March, 1944, M.B., B.S.

John Hodgson Nattrass died on December 4, 1943. We extend our deep sympathy to his widow and son.

ERNEST ARTHUR D'OMBRAIN.

We regret to announce the death of Dr. Ernest Arthur D'Ombraim, which occurred on June 23, 1944, at Killara, New South Wales.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Siedlecky, Stefania Winifred, M.B., B.S., 1943 (Univ. Sydney), Women's Hospital, Crown Street, Sydney.
Dwyer, Allan Frederick, M.B., B.S., 1942 (Univ. Sydney), 11, Mann Street, Gosford.
Taylor, William George, M.B., B.S., 1944 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.
Storey, Joan Evelyn, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Corbett, Walter Harold, M.B., B.S., 1943 (Univ. Sydney), Newcastle General Hospital, Newcastle.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Blaxland, George Frederick, M.B., B.S., 1943 (Univ. Sydney), 36, Eastern Road, Turramurra.
Bonneter, Ronald Howard, B.Sc., M.B., B.S., 1941 (Univ. Sydney), 1, Baden Powell Street, Artarmon.
Cahill, John Bareham, M.B., B.S., 1939 (Univ. Sydney), 91, Old South Head Road, Bondi Junction.
Freshney, Edwin Winston, M.B., B.S., 1940 (Univ. Sydney), c/o H.M.A.S. *Quickmatch*, c/o British Fleet Mail.
Furber, John Frederick Maynard, M.B., B.S., 1944 (Univ. Sydney), 9, Wunulla Road, Point Piper.
Furber, Thomas Rupert Maynard, M.B., B.S., 1944 (Univ. Sydney), Prince Henry Hospital, Little Bay.
Greenberg, Harris Phillip, M.B., B.S., 1944 (Univ. Sydney), St. George District Hospital, Kogarah.
Hill, Marie Eleanor (Bulteau), M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Hornbrook, John Wallis, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Menzies, Bruce Lambton, M.B., B.S., 1944 (Univ. Sydney), 14, Wolseley Street, Drummoyne.
 Potts, Ian Faulkner, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
 Potts, Theodore Kenneth, junior, M.B., B.S., 1944 (Univ. Sydney), 20, Glebe Road, Glebe.
 Rich, Beryl May, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
 Robinson, Kyran Victor, M.B., B.S., 1940 (Univ. Sydney), 94, Allison Road, Randwick.
 Robertson, John Arnold Struan, M.B., B.S., 1943 (Univ. Sydney), Sydney Hospital, Sydney.
 Sturrock, William Douglas, M.B., B.S., 1943 (Univ. Sydney), NX460, Major W. D. Sturrock, 113th (Concord) Military Hospital, Australia.
 Symons, Cedric York, M.B., B.S., 1941 (Univ. Sydney), NX111972, Captain C. Y. Symons, 2/7th Australian Field Ambulance, Australia.
 Thwaitte, Thomas John, M.B., B.S., 1944 (Univ. Sydney), B.Sc., 1942 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
 Welch, Edwin Stuart, M.B., B.S., 1926 (Univ. Melbourne), Tumbarumba, New South Wales.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association:

Alderman, Colin Graham, M.B., B.S., 1943 (Univ. Adelaide), Royal Adelaide Hospital.
 Morgan, David Archibald Stevenson, M.B., B.S., 1943 (Univ. Adelaide), Royal Adelaide Hospital.
 Moody, Charles Alfred, M.R.C.S., L.R.C.P., 1925, 593, Esplanade, Grange, South Australia.
 Oldfield, Neil, M.B., B.S., 1943 (Univ. Adelaide), R.A.A.F., Queensland.
 Sanderson, Kenneth Villiers, M.B., B.S., 1943 (Univ. Adelaide), Royal Adelaide Hospital.
 Burston, Robin Archibald, M.B., B.S., 1943 (Univ. Adelaide), Royal Adelaide Hospital.

Australian Medical Board Proceedings.

WESTERN AUSTRALIA.

THE undermentioned have been registered as legally qualified medical practitioners:

Franklin, Samuel de Vere, M.B., Ch.M., 1921 (Univ. Sydney), Perth.
 Georgeff, Nicholas Harry, M.B., B.S., 1944 (Univ. Melbourne), Perth Hospital.
 Birrell, Peter Matheson, M.B., B.S., 1944 (Univ. Melbourne), Perth Hospital.
 Harris, William Frederick Andrews, M.B., B.S., 1944 (Univ. Melbourne), Perth Hospital.
 Robinson, George David, M.B., B.S., 1944 (Univ. Melbourne), Perth Hospital.
 Griffiths, Edgar Lawrence, M.B., B.S., 1944 (Univ. Melbourne), Perth Hospital.
 Park, Charles Leslie, M.B., B.S., 1907 (Univ. Melbourne), M.D., 1918 (Univ. Melbourne), Department of Public Health, Perth.

Medical Appointments.

Dr. Henry Kenneth Fry has been reappointed an Official Visitor to the Parkside Mental Hospital, South Australia.

Books Received.

"A Handbook of Ophthalmology", by Humphrey Neame, F.R.C.S., and F. A. Williamson-Noble, F.R.C.S.; 1944; Fifth Edition. London: J. and A. Churchill Limited. 9½" x 6", pp. 343, with illustrations. Price: 18s.

"Vade Mecum of Medical Treatment", by W. Gordon Sears, M.D. (London), M.R.C.P. (London); Fourth Edition, 1943. London: Edward Arnold and Company. 7" x 4½", pp. 396. Price: 10s. 6d. net.

"The Control of Cross Infection in Hospitals (Memorandum Prepared for the Committee on Preventive Medicine of the Medical Research Council by the Sub-Committee on Cross Infection in Hospital Wards)"; Medical Research Council War Memorandum Number 11; 1944. London: His Majesty's Stationery Office. 9½" x 6", pp. 34. Price: 6d. net.

Diary for the Month.

JULY 4.—New South Wales Branch, B.M.A.: Council Quarterly.
 JULY 5.—Victorian Branch, B.M.A.: Branch Meeting.
 JULY 5.—Western Australian Branch, B.M.A.: Council Meeting.
 JULY 7.—Queensland Branch, B.M.A.: Branch Meeting.
 JULY 7.—Victorian Branch, B.M.A.: Legislative Subcommittee.
 JULY 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 JULY 11.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 JULY 11.—Tasmanian Branch, B.M.A.: Branch Meeting.
 JULY 14.—Queensland Branch, B.M.A.: Council Meeting.
 JULY 14.—Victorian Branch, B.M.A.: Ethics Subcommittee.
 JULY 17.—Victorian Branch, B.M.A.: Hospital Subcommittee.
 JULY 17.—Victorian Branch, B.M.A.: Finance Subcommittee.
 JULY 18.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 JULY 18.—Victorian Branch, B.M.A.: Organization Subcommittee.
 JULY 19.—Western Australian Branch, B.M.A.: Branch Meeting.
 JULY 20.—Victorian Branch, B.M.A.: Executive Meeting.
 JULY 20.—New South Wales Branch, B.M.A.: Clinical Meeting.
 JULY 25.—New South Wales Branch, B.M.A.: Ethics Committee.
 JULY 26.—Victorian Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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